The Croonian Lectures

ON

A NEW DEPARTURE IN CONNEXION WITH DIABETES.

Delivered at the Examination Hall, Victoria Embankment, June 19th and 21st,

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LECTURE I.

ON WHAT THE SYMPTOMS OF DIABETES DEPEND.

MR. PRESIDENT, COLLEAGUES, AND GENTLEMEN,—Diabetes is a disease which has been known by its symptoms from the most remote periods of antiquity. The essential feature of it is the elimination of sugar with the urine in a manner that ought not to occur. A healthy person takes carbohydrate food—that is to say, starch, sugar and so on—and this carbohydrate food which is taken by a healthy person goes to the service of the economy, benefits the economy, instead of running off, as it does in diabetes. Here lies the essential difference between health and diabetes. In health the carbohydrate food is retained in the system and contributes to its service; in diabetes, on the other hand, instead of being retained and turned to account, it simply runs off as useless material. All the main symptoms of diabetes depend upon this exit of sugar from the system. The excessive flow of water (urine), the wasting of the body, the loss of power, depend upon the non-utilisation of the carbohydrate material, permitting of its passage from the body by the kidney. The excessive flow of urine is an effect of this. The sugar is there and tends to escape, and in doing so it carries off water with it. This is the cause of the excessive flow of urine which takes place. Diminish the amount of sugar to be eliminated, and you immediately diminish the flow of urine taking place. The flow of urine is in proportion to the amount of sugar that has to be eliminated from the system. Again, thirst: if there is an exit of fluid there must be an ingress. The ingress, in order that the functions of life may be properly maintained, must be in proportion to the egress. Diabetic persons are apt to say, "I pass a lot of water because I drink a lot." It is the other way about. They drink a lot because they pass a lot. The passage of urine forms the first link of the chain, and with the passage of urine the system is left in want of fluid. In proportion to this want so is the patient induced to drink. The first link in the chain of evidence, I say, is the outflow of water. Again, the loss of weight—if the food is not properly applied, how can the body be properly maintained? If the food which is taken is passing off from the system in the form of waste material, how can the weight of the body be kept? Again, food is the equivalent of power, and in proportion as we take power in the form of food into our digestive canal, and it is permitted to escape from the system unutilised, there is a loss of strength or loss of power. The symptoms then depend entirely upon the non-utilisation of the carbohydrate food. Escaping from the system unutilised, it produces the various symptoms of the disease. The problem we have to solve in these lectures is, why does all this occur? How is it that in the healthy person the carbohydrate food becomes so applied as to be of service to the system, while in the diabetic non-utilisation occurs which results in the waste of material?

PRELIMINARY CONSIDERATIONS.

We must first note how carbohydrate food is applied and how it is appropriated by the system before we can approach profitably the subject of its non-appropriation. Physiology, in other words, must precede pathology. We cannot expect to have a right understanding of the reason why the carbohydrate food is not turned to account in the system as it ought to be unless we know something of the manner in which it is, under natural circumstances, made use of. This constitutes my apology for taking you into the consideration of some preliminary matters.

We can appeal to the whole of living nature. What is occurring in our own bodies is nothing more than comparable to occurrences taking place in the bodies of organisms much lower in the scale than we are placed, and as we descend in the scale so we get a greater simplicity of organism, and at the lower end of the animal and vegetable kingdoms we may be able to unravel occurrences which in more complex organisms escaped our understanding. The subject embraces nothing more nor less than the physiology of the carbohydrates and involves the study of the part played by carbohydrate matter in living nature. Carbohydrates constitute a well-defined group of principles, consisting of carbon and the elements of water. It is not for a moment to be understood that they are to be regarded as hydrates of carbon, although the composition represents as much. They are bodies with carbon and hydrogen and oxygen, the hydrogen and oxygen being in proportion to form water. Chemists resolve them into much more complex formulæ. The carbohydrates present a striking contrast to fats as regards the relative amount of oxygen. You see that in the formula the oxygen is in very much larger proportion to the carbon and hydrogen than it is in fats, taking stearine, palmitine, and oleine. This forms a great distinction between carbohydrates and fats.

THE DISTRIBUTION OF THE CARBOHYDRATES IN NATURE.

Carbohydrates are of great importance on account of their extensive distribution throughout Nature. I do not know whether the members of the audience before me have ever given thought to the extent to which carbohydrates exist in living nature. Probably they make up, in the form of cellulose, lignose, and starch, eight-tenths, if not more, of the organic matter existing. You cannot go anywhere in the vegetable kingdom without meeting with them as the chief constituents of the structure that you have before you. Every blade of grass, every leaf, every stem, every branch from a stem, every root, is made up in great part of carbohydrates. The carbohydrates constitute, then, the main portion of vegetable organic matter, and, as we shall see later on, they enter largely, either in a free or combined state, into the constitution of animal beings.

CARBOHYDRATES THE SOURCE OF ORGANIC MATTER.

Not only do they stand in the position named, but they constitute the source of organic matter. Starch is regarded as constituting the primordial organic product. Every organic substance that we meet with has originated, according to the views prevailing, from starch. If starch constitute the primordial organic product—fat, proteids, everything organic, must have proceeded from it. The source of the starch is the chlorophyll corpuscles which exist in the leaf of the plant. These chlorophyll corpuscles are to be seen in the vegetable cells. They are little living masses of protoplasm—living matter endowed with the power under the influence of the sun's rays (and not without this influence) of fixing the carbon of the carbonic acid of the air. The carbon is unlocked, as it were, from its combination with oxygen in carbonic acid. The unlocking is due to the power derived from the sun, and, as this power is exerted in the direction of the liberation of carbon from the oxygen in carbonic acid, so it becomes locked up in a latent state in the product formed—hence the power which is afterwards to be obtained from these products. In the case of coal, the product of extinct vegetation, the power which is locked up in it was derived in former ages from the action of these chlorophyll corpuscles, the sun having influenced them in such a way as to unlock the carbon from the carbonic acid—the power, I say, exerted in this way was rendered latent in the product formed. Now, the starch which makes its appearance in these chlorophyll corpuscles forms the first visible organic product. There may be some body existing between the formation of starch and the carbonic acid, but it has not been recognised and it is not known. The first visible organic product is the starch which develops in these chlorophyll corpuscles, so that we have to look upon the carbohydrates, the bodies to which our attention is being directed, as making up the great proportion of organic nature and at the same time as constituting the source of all organic products. As carbohydrates are formed in the leaves under the influence of the sun's rays, so mineral matter and nitrogen-containing compounds are absorbed by the roots, and these substances, coming into relation with the carbohydrates produced in the leaves, give rise to the various organic products which are met with in the vegetable kingdom. These various products owe their origin to the constructive influence of living matter upon carbohydrates, nitrogen-containing compounds, and mineral matters.

CARBOHYDRATES ARRANGED IN GROUPS.

The carbohydrates arrange themselves conveniently into the groups that are placed upon the table before you—into

"amyloses," substances of the lowest hydration, "saccharoses" standing next, and the "glucoses," of the highest hydration. In the ordinary carbohydrates the carbon atoms stand as six or some multiple of six.

Carbohydrate Groups.		
Amyloses $C_6H_{10}O_5$	Starch.	
	Cellulose.	
	Glycogen, &c.	
Saccharoses $C_{12}H_{22}O_{11}$	Maltose.	
	Cane sugar.	
	Lactose, &c.	
Glucoses $C_6H_{12}O_6$	Dextrose.	
	Lævulose.	
	Galactose, &c.	

Chemists have recently discovered that there are carbohydrates or sugars, with, it may be, two atoms of carbon, three atoms of carbon, four, five, seven, eight, or nine respectively, which are spoken of as the "two atom carbon sugars," and so on; but the sugars with the carbon atoms that we have to deal with physiologically are those which are placed upon the above list. The amyloses, consisting of starch, cellulose, glycogen, &c., have six atoms of carbon, with ten atoms of hydrogen and five of oxygen. The saccharoses, consisting of maltose, cane sugar, lactose, &c., have twelve atoms of carbon, twenty-two of hydrogen, and eleven of oxygen, equivalent to six of carbon, eleven of hydrogen, and five and a half of oxygen. The glucoses, consisting of dextrose (the ordinary grape sugar), lævulose, and galactose (coming from milk-sugar), have six atoms of carbon, twelve of hydrogen, and six of oxygen.

Now these groups are important because the carbohydrates pass from one to the other by the influence of different powers. You have hydration and dehydration determined by widely different influences—influences that will have to occupy a great deal of our attention. For instance, an amylose carbohydrate may be hydrated into a saccharose carbohydrate. Starch, in other words, may be converted into maltose. Again, a member of the saccharose group may be hydrated into a member of the glucose group. Maltose, for instance, may be converted into dextrose. Cane sugar may be converted into a mixture of lævulose and dextrose, and lactose may give rise to galactose. That is what we can do readily in the laboratory. This hydration of carbohydrates is effected by means of chemical agents and ferments. It is a kind of change which we can observe taking place under our own eyes when the substances are boiled with dilute acids. Amyloses are converted into saccharoses by means of diastase of the vegetable kingdom and the amylolytic ferments of the saliva and of the pancreatic juice of the animal kingdom. Under the influence of these ferments increased hydration is made to take place. But carbohydrates can be carried in an opposite direction, not, as a rule, under our observation—the dehydration is effected in the laboratory of living nature. Their hydration we can bring about readily enough in the laboratory, but dehydration not so. It *is* to be effected in the laboratory—for instance, on heating dextrose ($C_6H_{12}O_6$) to 170° C. it is reduced in hydration, giving off a molecule of water (H_2O), and being converted into a member of the amylose group ($C_6H_{10}O_5$). By heating lævulose to a certain temperature it also gives off a molecule of water and is reduced to a member of the amylose group. Moreover, these products (glucosan coming from dextrose, and lævulosan coming from lævulose) are susceptible, on boiling with acids, of changing back to members of the glucose group. Dehydration is exceptional under our own observation, though it is what ordinarily takes place in living nature. It is a change effected by protoplasmic action in contradistinction to ferment action. Ferment action hydrates, or carries members of the amylose group to the saccharose or, it may be, the glucose group.

THE ACTION OF PROTOPLASM ON CARBOHYDRATES.

Protoplasmic matter, on the other hand, dehydrates—that is, carries carbohydrates exactly in the opposite direction—namely, from the glucose and saccharose groups down to the amylose group. I will give you illustrations of this, and the most simple illustration that I can adduce is the fact that yeast cells when put into a solution of sugar grow and form cellulose, which is a constituent of yeast cells, and also form glycogen. The fungi stand in a peculiar position: although members of the vegetable kingdom, yet they have many relations closely allied to the animal kingdom. Thus, instead of forming starch (there is no starch to be met with in the members of the mushroom tribe or the fungi), they form glycogen, as we animal beings do. There is no difficulty whatever in extracting glycogen from the yeast plant. Now these yeast cells, when put into a solution of sugar, grow, and in growing they form cellulose, which belongs to the amylose group. Instead of the sugar contained in the solution, which, when cane sugar is used, belongs to the saccharose group, they yield cellulose and likewise glycogen. This, then, is a simple illustration of the dehydration of carbohydrate matter. This process takes place very largely in the vegetable kingdom. Let us look, for instance, at the fabric cellulose and the storage starch of plants. How have these been formed? Starch and cellulose cannot move as such when once deposited. As long as they remain in the state of starch and cellulose they are fixed. They require to be dissolved—in other words converted into sugar—before they can move and subsequently contribute to the changes of life. We have the first formed starch in the chlorophyll corpuscles. The chlorophyll corpuscles grow. The protoplasm seems to disappear, and starch granules come into view. But these granules would be of no use to the plant if there were not some subsequent change. By ferment action the starch is converted into sugar, a body in a higher state of hydration, and the sugar flows along in the sap. It then reaches the part where growth is taking place, and what occurs? Cellulose is formed—cellulose, a body of a lower state of hydration. So that, first of all, we have our starch to begin with in the chlorophyll corpuscles, and this by ferment action is converted into sugar, a higher form of hydration. This passes along to the seat of growth, and here the sugar is dehydrated into cellulose or, it may be, into lignose. That is what occurs as far as the organism of the plant itself is concerned. But the future has to be provided for. Nature not only looks after the organism itself, it provides for the continuance of the species, and carbohydrate for this purpose becomes stored up. Sugar is conveyed to the growing part, constituting the seed. Here we have a representation of the section of a grain of wheat. Whilst the wheat grain was growing dehydration was taking place. The sugar of the sap of the plant passed to the grain. There existed at the time living protoplasm which dehydrated the sugar into starch, and the starch would remain there unless it were subjected to some further action. What occurs subsequently? You have the wheat grain consisting of deposited starch, and a little part of it is endowed with the power of manifesting active life when the requisite conditions of warmth and moisture are supplied. The ferment which changes the starch of the grain is not developed in the substance of the grain itself. Cut away the protoplasmic part, and you may put the grain into water or into earth, and it will not grow. There has been life in the other part at one time—namely, when the sugar or sap was being dehydrated into the condition of starch—but afterwards life here is lost. The life, or at least the power of passing into active life, exists in what is called the embryo, and under the requisite conditions the embryo gives rise to a ferment which acts upon the starch and converts it into sugar; the sugar so formed is appropriated by the embryo and leads to the development of the cellulose belonging to it. You see the succession—the play of changes—that are here presented to view. I consider them of great service in enabling us to unravel some of the processes of life in our own bodies.

ANALOGY BETWEEN PLANT LIFE AND ANIMAL LIFE.

It may be said that life essentially is chemical change. We can have no active life without chemical change, and this resolves itself into a delicately balanced play of ferment and protoplasmic actions — ferment action hydrating and splitting up; protoplasmic action, doing exactly the reverse, dehydrating and synthesising. These two powers—ferment and protoplasmic—exactly antagonise each other, and if we look closely at the phenomena of life we can trace that these phenomena are in the main due to the reciprocal action of these two influences. There may be also chemical affinity at work. If an acid comes into contact with an alkali in the body, in all probability it combines with it. We do not know much of electrical power. There may be this exercising an influence in producing chemical change. There may be nerve power exerting an influence in the same way as electrical power acts in bringing about chemical changes, but of this also we do not know anything decided. We do know about ferment action and protoplasmic action, and through these we have the play of changes which may determine the phenomena

occurring not only in the simple organism but likewise in our own bodies. As I have said, we trace in the storage starch, which has been deposited by protoplasmic action, the process of dehydration from a higher hydrated carbohydrate. We find that when it is required, a ferment is developed which leads to its solution or conversion into sugar, and, this having been done, it is subsequently reconverted by the protoplasmic agency of the living embryo into a dehydrated product again—namely, cellulose. It is in this way that the plants I show you have grown. They are capable of maintaining themselves now. They have leaves and can produce starch, and from this further growth takes place. In the early stage of their existence they entirely depended upon the starchy matter contained in the seed itself. Here is a chestnut which is defectively developed. But it is an illustration of what I am referring to. The radicle has been thrown down and roots have been formed, but there is no leaf, no self capacity for forming starch; the whole of the plant visible has been derived from the starch originally present in the seed. The starch was converted into sugar by ferment action and then subsequently reduced by protoplasmic action into the cellulose, which we find existing in the stem and the roots.

We trace exactly the same taking place in our own bodies—the play of ferment and protoplasmic actions upon carbohydrate matter. We take starch as food. The starch is first of all converted into sugar by the ferment in the mouth (saliva), but more especially by the ferment of the pancreatic juice. It is absorbed and carried to the liver, comes into relation there with the protoplasmic agents (the cells of the liver), and is reduced to glycogen. First of all, hydration; next, dehydration. Now, the nature of the end product is generally in the vegetable kingdom the result of transmutation, the result of the carrying down of carbohydrate matter into starch, or cellulose, or lignose. This transmutation in the direction of dehydration fulfils all that is required. The carbohydrate is carried down into cellulose, or lignose, or starch, and when carried down into the cellulose or lignose it remains as such. It constitutes the fabric of the organism. When carried into starch it is only deposited in this state temporarily, and ultimately passes into cellulose — not belonging to the original organism, but to the subsequent or propagated organism.

CARBOHYDRATES UTILISED IN THE CONSTRUCTION OF PROTEID.

In the animal kingdom we find that an illustration can be adduced of transmutation of carbohydrate giving rise to an end product. In the tunicata the investing membrane contains cellulose, and the carbohydrate is carried into cellulose, and thus remains, constituting a part of the fabric of the organism. This is not usual in the animal kingdom. We have to look to other destinations of carbohydrate, and these are proteid construction and fat formation—the transformation of carbohydrate into fat and incorporation with nitrogenous matter into proteid.

That carbohydrate is utilised in this way is readily susceptible of absolute demonstration. I will refer again to yeast cells. If yeast cells, which constitute little masses of living protoplasm, are put into what is called Pasteur's liquid, which consists of—

Ammonium tartrate $(NH_4)_2C_4H_4O_6$	= 1
Cane sugar	= 10
Ash of yeast	= 1
Water	= 100

Note.—Ammonium nitrate may be substituted for the ammonium tartrate.

they grow, and fresh yeast cells are produced—single yeast cells produce buds and go on to form chains. They grow, and this proves that we have fresh protoplasm, and, if so, there must also be fresh proteid, which is the basis of protoplasm. Growth taking place in the liquid affords absolute proof that the production of proteid matter has occurred. What is there to yield the proteid? In the liquid there are only these principles: ammonium tartrate, cane sugar, ash of yeast, and water. The natural conclusion would be that the cane sugar becomes incorporated with the nitrogen of the ammonium tartrate and gives rise to the proteid. Well, an objection may be raised that the ammonium tartrate is a carbon compound, and that the carbon of the proteid may come from the tartaric acid of the ammonium tartrate; but this objection is removed by taking ammonium nitrate, and if we take the ammonium nitrate we have absolutely no other source for the carbon in the proteid matter besides the sugar which is present. You get, therefore, the absolute demonstration that carbohydrate is utilised in the construction of proteid, and nothing is more rational than to conclude that the carbohydrate is incorporated with the nitrogen-containing compound so as to build up the proteid.

It is suggested by vegetable physiologists that in all probability sugar is not directly transmuted into cellulose and starch, but first of all becomes incorporated with nitrogenous matter to form a proteid, and that from the proteid so formed the starch and cellulose are cleaved off. They suggest that the sugar contained in the sap is not in a direct way transmuted down into the dehydrated product, but that it first of all enters into a combination with a nitrogenous principle that exists widely in the vegetable kingdom, called asparagine ($C_4H_8N_2O_3$). We must not be misled by this name and think simply of a principle belonging to the juice of the asparagus. It is a crystallisable and diffusible principle, nitrogenous in character, largely existing throughout the vegetable kingdom, and it is supposed by vegetable physiologists that this asparagine, the nitrogen of which gets into the plant from the roots, coming into relation with sugar in the sap, and brought within the sphere of influence of protoplasmic matter, combines with the sugar so as to form proteid, and that from this proteid the starch or cellulose subsequently existing become cleaved off.

A Communication

ON THE

CHOLERA VIBRIO AND THE BACTERIOLOGICAL DIAGNOSIS OF CHOLERA.

Specially written for THE LANCET

BY PROFESSOR MAX GRUBER OF VIENNA.

TRANSLATED BY J. W. WASHBOURN, M.D., F.R.C.P. LOND., F.R.C.S. ENG.

TEN years ago, when Koch discovered the presence of comma bacilli in the intestinal contents and the evacuations of cases of Asiatic cholera, it was thought that this micro-organism possessed characters quite dissimilar from that of any other species. In the course of time, however, our knowledge has increased, and it is now known that the vibrios obtained from different cases of cholera and from different epidemics are not altogether similar and are not altogether invariable in their properties—in fact, we are more and more convinced that in the cholera vibrio we are dealing with a member of a large group of similar micro-organisms, and the experience of the last few years has taught us that vibrios exactly similar in many points to the cholera vibrio—and, as far as we know, unconnected with the disease of cholera—are widely distributed throughout Europe. Thus questions of the greatest etiological importance arise. What means do we possess of distinguishing the cholera vibrio from other kinds of vibrios? Is there only one species of vibrio present in cholera or are there several? Are the vibrios which are found apart from cholera distinguishable and of a different species from the cholera vibrios or are they all varieties of the same species? Accordingly, I will attempt to give a critical account of the diagnostic value of the cholera vibrio, a difficult task, and one which must be undertaken with care, for it is important not to reject anything which is well established, or to accept anything which is questionable and controversial. Let us proceed step by step. The number of species of bacteria having the form of cork-screws, spirals, or segments of spirals is very large. In the diagnosis of cholera we must only consider those varieties of the spiral-shaped bacteria whose principal form is the comma bacillus or "half-spiral," which have a thickness of 0·5–1·0 μ, are capable of being cultivated on gelatine and other media, and which sooner or later produce liquefaction of the gelatine. How can we distinguish these species from one another? It is well known that different species of bacteria can only be certainly distinguished after they have been isolated in pure cultivations. This must be done in the case of the vibrios. As a rule it is quite easy. The vibrios in question grow well and quickly in gelatine, and by means of plate cultivations pure cultivations can easily be obtained if the number of vibrios present is not too small. Often, however, the vibrios are scanty and many other kinds of bacteria

are present in the material under examination, and then it is necessary to use the method described by Schottelius. The suspected material is first sown in a fluid medium such as broth, and is kept at a suitable temperature. The vibrios which are motile and need oxygen for their development seek the upper layer of the fluid and develop with such rapidity that they soon outstrip in their growth the other bacteria. By a microscopical examination they can readily be demonstrated, and by means of gelatine plates pure cultivations can be obtained. The rapidity of the growth in the upper layers of the liquid depends on the temperature. At the usual temperature of the laboratory it may be four or five days before the growth can be observed, but at 37° C twelve to twenty-four hours are sufficient. The growth of the vibrios in such a preliminary cultivation is favoured by a strongly alkaline reaction of the medium. The success of Buchner's[1] method by making the preliminary cultivation in a mixture of broth and sterilised broth cultivation of the cholera vibrio depends essentially upon the alkalinity which such a mixture possesses. While Schottelius adds a comparatively large quantity of the material to a small quantity of broth,[2] I prefer to add a small quantity of the material (a flake of mucus or a loop full of the cholera evacuation) to a large quantity of broth (10 c.c.). With this slight modification Schottelius' method, both in my hands and those of others, has yielded most excellent results. Recently the school of Koch have recognised the value of this method, and Dunbar[3] has rendered it more delicate by substituting for the broth a solution of 1 per cent. peptone in 1 per cent. salt solution. In the upper layers of this medium the vibrios grow much more rapidly than any other bacteria, so that within a certain time they can often be found in these layers in pure cultivation. If plate cultivations are made from the pellicle which forms on the surface of such a preliminary cultivation pure cultivations of the vibrio can be obtained even if only very few were present in the original material. The modification of this method proposed by Koch[4] for isolating the vibrio from water is of great practical value. Peptone and salt are added to large quantities of the water (100 c.c.), so as to make up a 1 per cent. solution of each of these substances. This is then kept in an incubator at 37° C. The preliminary cultivation naturally excludes the vibrios which are not motile, which have no need for oxygen, or which are not capable of growing at high temperatures in broth or in the peptone-salt solution. Nevertheless, there is a large number of vibrios which grow in the same way in the preliminary cultivation as the Koch's vibrio, so that such a growth does not possess any differential diagnostic value *per se*. Pure cultivations must be made in agar and gelatine from the preliminary cultivation, and it is only then that we can attempt to distinguish the different species.

Many attempts have been made to formulate characteristic differences in the microscopical appearances between Koch's and the other comma bacilli. These attempts have, as a rule, been in vain because one and the same race of Koch's and the other vibrios present such different morphological characters according to the condition of growth and the age of the cultivation. The difference in the microscopical appearance between individual races and cultivations is often greater than that between different species, so that it is impossible to distinguish the cholera vibrio by this method. This made me[5] oppose the view of Cunningham[6] that there are several kinds of cholera vibrios capable of being distinguished microscopically. Nevertheless, I am acquainted with the variety of cholera vibrio first described by Pasquale[7] in an epidemic in Massauah, and must admit that it differs in the most remarkable way from Koch's vibrio. It is larger, straighter, and the ends are pointed. These peculiarities have been preserved for a year and a half in cultivations on various media and in the body of animals. Still more marked is the difference in shape when the flagella are stained. This can readily be effected by the excellent method of Ermengen.[8] On examining a successful preparation of the Massauah vibrio one is astonished to find, at the end of the large, almost straight rods, a bunch consisting of four, five, or six flagella; while it is well known that the typical Koch's vibrio bears only a single flagellum at the free end and is similar in this respect to allied species such as vibrio berolinensis,[9] V. danubicus,[10] V. Metchnikoff, V. proteus, and V. Deneke. At first the contrast appears so great that one feels convinced that we are dealing with a distinct species, and to those who, with Koch and his school, consider bacteria to be organisms possessing a constant shape such a course is the only one open. Those who know how common polymorphism is with many kinds of species of bacteria will abstain from deciding the question so quickly. At the present time I am still less inclined to assert that the Massauah vibrio is a distinct species and not a simple variety of Koch's vibrio, since careful investigations have taught me that the different kinds of cholera vibrios are not so sharply defined from one another by the number of the flagella as was at first thought. Nicolle and Moran,[11] who were the first to make us familiar with the number of the flagella, state that in almost every preparation of the single flagellated species there are found isolated instances of comma bacilli with two flagella. I myself have met with many cultivations from the epidemic in East Galicia, in which, although the shape was typical, yet by no means an insignificant proportion possessed two or three flagella. This is all we need say with regard to the number of the flagella. There is, moreover, the possibility that Indian cholera is not etiologically to be considered a single process. It is indeed quite conceivable that in India many kinds of vibrios are indigenous and are capable of growing in the human intestine and producing the symptoms of cholera. The observation of the movements of the living vibrios is of little value in distinguishing the different species since the same species varies so much in this respect.

Special attention has been paid to the appearance of the growth of the cholera vibrio in gelatine and to the way in which the gelatine is liquefied. For a long time it was considered that a simple method of diagnosis consisted in the rapidity and the manner in which the gelatine became liquefied. Special stress was laid upon the appearance of the so-called "stab cultivations" in gelatine. The moderate liquefaction, rapidly decreasing in the depths of the gelatine, and the formation of a bubble caused by the evaporation of the water were supposed to be distinguishing characteristics of the cholera vibrio. The matter, however, is by no means so simple. Gross differences in the liquefying properties certainly are of much importance: for example, the typical vibrio proteus can always be distinguished in this way from the cholera vibrio; but in the distinction from other species simulating the cholera vibrio this does not hold. The fact is that the different generations of the cholera vibrio show such differences in the property of liquefying gelatine—some liquefying almost as rapidly as the vibrio proteus and some hardly liquefying at all—that most of the allied species of vibrios lie within these limits. The value of the gelatine stab cultivations is thus so restricted that Koch[12] himself has recently quite given up using this method. Gelatine plate cultivations are of much more value. Even with this method one must not imagine that characteristic appearances can always be made out with the naked eye, even if one admits that the character of the liquefaction and the formation of the little depressions are useful indications for distinguishing the suspected colonies. Reliable means of determining the species are only obtained by examination of the colonies when magnified from eighty to 120 times. Before entering into this point I must, however, point out that the character of the nutrient medium and the general conditions of growth have much influence upon the appearance of the colonies, so that it is only by the most painstaking care in keeping the conditions alike that comparative results can be obtained. The gelatine must always be of the same composition. I always use a 10 per cent. gelatine which has been prepared according to the method of Petri and Maasen[13] which has been rendered sufficiently alkaline to give the reaction with rosalic acid. The vibrio colonies appear more characteristic in such gelatine than in that containing more alkali.

The temperature has a special influence upon the energy of the growth and of the liquefaction, and must always be kept at about the same level. The most suitable temperature is

[1] Münchener Aerztliches Intelligenzblatt, 1885, No. 50.
[2] Wiener Med. Wochenschrift, 1887, Nos. 7 and 8.
[3] Koch's Zeitschrift für Hygiene und Infectionskrankheiten, Band xiv., S. 336.
[4] Loc. cit., p. 335.
[5] Transactions of the Seventh International Congress of Hygiene, vol. ii., p. 41.
[6] Archiv für Hygiene, Band xiv., p. 49.
[7] Riforma Medica, 1892, i., p. 310.
[8] Travaux du Laborat. d'Hygiène et de Bactériologie de l'Université de Gand, i., S.A.
[9] Rubner: Hygien. Rundschau, 1893, No. 16. Nasser: Archiv für Hygiene.
[10] Heider: Centralblatt für Bakter. u. Parasit., Band xiv., No. 2.
[11] Annales de l'Institut Pasteur, 1893, No. 7, p. 557.
[12] Zeitschrift für Hygiene, Band xiv.
[13] Arbeiten aus dem Kaiserl. Gesundheitsamte, Band viii., p. 311.

between 20° and 22° C. Quite as important is the supply of oxygen to the colonies. The difference in appearance between the superficial and deeply placed colonies depends essentially upon this circumstance. The influence of the oxygen is so great that even the thickness of the layer of gelatine in the plate alters the appearance of the colonies. As far as possible the same quantity of gelatine should be used for each plate, and care must be taken that the plates should be perfectly level when making the cultivation so as to prevent any difference in the thickness of the different parts of the layer of gelatine. The number of germs planted in the medium is of importance, and so is the presence or absence of other kinds of bacteria. The appearance of the vibrio colonies in cultivations made from a mixture of bacteria is quite different from that of pure cultivations, and in the latter differences are observed according to whether the colonies are closely packed in the plate (first dilution) or are sparsely scattered (second or third dilution). The closer the colonies are together the smaller they remain, but the softening and liquefaction of the gelatine proceed more quickly. The difficulties produced by the dependence of the appearance of the colonies upon so many different circumstances are considerable, and it is only by practice and experience that a correct judgment is formed. To be accurate it is necessary in every case to make plate cultivations from pure cultivations with three or more dilutions. We must also remember that the distinguishing characters of different species only make their appearance at certain stages of development, so that the observation must be repeated at definite intervals of time.

In observing the peculiarities of the colonies of the cholera vibrio in gelatine plates we must distinguish between those which are on the surface from those in the depth of the gelatine, as their appearance is quite different. The superficial colonies of some kinds of cholera vibrios at a period of growth between fifteen and forty-eight hours after sowing present characters which distinguish them from all other known vibrios with the exception of Deneke's cheese vibrio. These are the typical forms agreeing with the classical description of Koch. The colony appears as an irregular-shaped, coarsely granular mass, with a refractile margin. The latter is an optical appearance, which is produced by the water evaporating from the liquefied gelatine in the immediate neighbourhood of the colony, allowing the colony to sink into a little depression with sharply curved walls. During the further development the "granules" become larger, the massing together of the granules into separate clumps proceeds, the depressions become deeper, and the refractility more pronounced, so that in a certain stage the colonies appear like a heap of small crystals or particles of glass. Still later individual little refractile masses become separated from the rest of the vegetation, and swim about in the liquefied zone, which has now increased in size. At the same time the centre of the vegetation becomes of a brownish colour. To the naked eye the zone of liquefaction at this stage appears quite transparent. The more the liquefaction and the breaking up of the vegetation occur the more the colony loses its characteristic appearance. In individual colonies many differences are observed from this typical appearance depending upon the amount of liquefaction and the tenacity of the vegetation. Colonies are met with in which the vegetation spreads quicker than the liquefaction and evaporation, so as to appear as a layer over the walls of the depression. The crystalline appearance of the vegetation is, however, characteristic for all typical superficial colonies of the cholera vibrio. We must not expect always to find this typical appearance even in cultivations obtained directly from the intestinal contents. If the power of liquefaction and the motility overstep a certain limit, then the crystalline appearance of the vegetation, which depends on the optical effect of the little depression, is never very marked and may be altogether absent. I once met with a kind of cholera vibrio the colonies of which after twenty-four hours formed circular little cups filled with a turbid fluid, and in which the vegetation, separated into small masses, swim about. These colonies were exactly like those of Metchnikoff's vibrio. On the other hand, there are some kinds of cholera vibrio which, as Koch himself has lately admitted, liquefy very slowly. The superficial colonies, then, have quite an atypical appearance. In the earliest stage of development these colonies appear like tiny colourless drops or discs, which project on the surface of the non-liquefied gelatine. They have at this stage often the appearance of minute typhoid colonies, with a similar toothed contour and with the same furrowed and finely granular appearance. According to the peculiarity of the special kind, and according to the thickness in which the colonies are packed, a longer or shorter time is taken for the gelatine to soften and liquefy. Sometimes this only takes place after several days and not until the colonies have reached a comparatively large size (one millimetre in diameter or more). I possess cultivations of Koch's vibrio which liquefy more slowly than the vibrio berolinensis. As the colonies increase in size the fine uniform granulation becomes more marked, the contour becomes ragged, and the surface rough and split up into furrows. If in the meanwhile softening and liquefaction of the gelatine occur the margin of the colonies becomes brighter, but one never sees the refractile and crystalline appearance of the typical colonies. The appearance of such atypical colonies can be best compared to that of a cauliflower. Later the breaking up of the vegetation into little masses in the liquefied gelatine occurs in the usual manner. I must insist upon the fact that certain kinds of cholera vibrio form only these atypical colonies, or, at any rate, they can be cultivated for a long time without altering the appearance of the colonies and without the formation of typical colonies amongst the atypical ones. The two kinds of colonies are so distinct that one might attempt to describe two kinds of cholera vibrios simply on the ground of these differences. One would be still more inclined to this view from the fact that in certain material the one or the other kind is exclusively found. I was much struck on finding that nearly all the cultivations made by me from cases in East Galicia, as well as the three cases occurring this year in Vienna, presented this atypical growth. Some of the thirty-one cultivations which I examined nevertheless presented the typical growth. It was, however, proved that many of the cholera cases from which they were derived were probably of a different origin to the majority of the East Galicia cases, which arose along the Szigeth-Stanislau railway on the frontier between Hungary and Galicia. The origin of a few of the cases with typical colonies could not be traced definitely. I considered it less justifiable to accept a division of species on the ground of these differences because I had observed some years previously that perfectly typical cholera cultivation could assume an atypical form when cultivated through several generations under certain conditions (for example on agar).

It is very unfortunate for the diagnosis of Koch's vibrio that these differences occur and that the atypical form of the superficial colonies may present a puzzling resemblance to the atypical forms of other vibrio species. I must confess that, on account of this and of other experiences to be described later, I was for a long time of the opinion that there was no reliable criterion for distinguishing Koch's vibrio from other similar species and that it was quite impossible in many cases to say whether a given vibrio, met with unconnected with cholera, was Koch's vibrio or not. It is well known that several experienced bacteriologists are of this opinion.

Further investigations have, however, convinced me that all kinds of cholera vibrios present characteristic appearances in gelatine plate cultivation, and I would venture to distinguish by means of gelatine plates the Koch's vibrio from all similar species with the exception of Deneke's vibrio. This is possible by means of the characteristics which Gunther[14] has especially drawn attention to: 1. The superficial colonies at the earliest stage present an irregular (never simply round or oval) shape, and have either a coarsely granular or a furrowed and lined appearance; while the colonies of all other vibrios we have examined, with the exception alluded to above, have a rounded shape and appear quite structureless, or at most are finely lined. 2. The deeply seated colonies of all kinds, even in sparsely sown plates, present at an early stage an irregular shape, a wavy, uneven surface, and either a coarsely granular appearance or that of a number of coils of intestine. The shape of these deeply seated colonies reminds one forcibly of that of a mulberry. In the case of old and attenuated cultivations this irregular, uneven appearance may be only slightly marked, but it is always present. Often the deeply seated colonies send little protuberances on the surface, which appear, according to the focus, either as brightly refractile or dark circles on the colonies, and give the impression of the colonies being pierced with a bradawl (Koch). On the contrary, the youngest deep-seated colonies of all other vibrios we have examined, with the exception of Deneke's, appear,

[14] Einführung in das Studium der Bacteriologie, Auflage iii., p. 270.

especially in thinly sown plates, rounded, quite structureless, and with a smooth surface. On thickly sown plates, in which softening of the gelatine occurs early, the earliest stage of development of the deeply seated as well as of the superficial colonies of these vibrios present a very great similarity to the cholera vibrio. The determining observation must be made during the first twelve to twenty hours because later the differences disappear. I am quite aware of and have often drawn attention to the uncertainty of determining the species by means of the appearance of the colonies, since in addition to the peculiarity of the microbe the external conditions have so great an influence, and since slight quantitative differences in the production of proteolytic enzymes, in the rapidity of growth, and in the motile power can and do produce the most striking differences in the appearance of the colonies. My pupil, Firtsch,[15] has shown that the vibrio proteus can present four lasting modifications in the shape of the colonies which possess no resemblance to one another and would have been looked upon as different species had one not kept in mind their genetical relationship. The somewhat constant varieties of the cholera vibrio, which have already been mentioned, offer a further example in this respect. The race of Metchnikoff's vibrio, which has been cultivated through many generations in my laboratory in the course of years, has altered its behaviour in gelatine to such an extent that no one would recognise it from the original accurate description of Pfeiffer.[16] It liquefies the gelatine very slowly—not until forty to sixty hours does any sign of liquefaction occur. In a certain stage the superficial and deep colonies present many resemblances to those of atypical cholera. When liquefaction occurs the liquefied gelatine remains clear and the vegetation is matted together into a coil of bands and cords. The vibrio danubicus has undergone a most remarkable change in the opposite direction since it was first discovered and described by Heider. At the beginning it possessed only a moderate power of liquefaction, much less than that of Metchnikoff's vibrio, and consequently in stab cultivations was very similar to the typical cholera vibrio. This was admitted by the most prominent Vienna bacteriologists to whom it was shown. In the course of months its power of producing an enzyme has so increased that stab cultivations now can scarcely be distinguished from those of the typical vibrio proteus, and in plate cultivations the appearance at every stage has only a slight resemblance to that of Koch's vibrio. I would, however, in no way assert that the verification of the above-mentioned peculiarities of Koch's vibrio proves that a genetical relationship does not exist between it and one or the other above-mentioned kinds of species of vibrio. On the other hand, it appears to me to be opposed to the principles of natural history if one simply neglected such constant if slight differences and, without considering them, accepted the identity between Koch's vibrio and any one of the other hitherto described species. Not much value can be placed on most of the other characteristics which have been attributed to the cholera vibrio. The amount of turbidity and the formation of a pellicle on broth at 37° C. are so variable that it proves as little a difference of species as does the striking difference in the growth on potato. These depend so much on the race of the vibrio and the different constitution of the samples of potato used. The characteristic of growing upon potato only at temperatures above 22° C. is also of little value. The "Massauah" cholera vibrio grows often quite well at low temperatures. The behaviour to milk is of as little value. While many races do not obviously alter milk, others coagulate it within from three to six days in the same way as the vibrio danubicus, vibrio proteus, and others. The vibrio danubicus and many other hitherto undescribed species of vibrio, which Max Teich and E. Wiener have isolated from the Danube Canal, reduce litmus broth in the same way as the cholera vibrio. The colonies of the vibrio danubicus and other water bacteria have the same semen-like odour as the Koch's vibrio. It is quite impossible to draw any conclusions from the appearance of agar cultivations. All the species of bacteria resembling the cholera vibrio form on the surface of agar a peculiar transparent, brownish-grey layer with a smooth shining surface, and can thus certainly be distinguished from many other species of bacteria, but not from one another. The diagnostic value of agar cultivations is thus not to be compared with those on gelatine.

(To be continued.)

[15] Archiv für Hygiene, Band viii., p. 369.
[16] Zeitschrift für Hygiene, Band vii.

THE NATURE AND TREATMENT OF ASPHYXIA NEONATORUM.[1]

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THE first case of a condition new to us is frequently that which impresses itself most vividly upon our memory. When a senior student of medicine at the University of Edinburgh I attended a primipara during labour. The vertex presented, the labour was protracted, and the membranes remained unruptured until about an hour before the birth of the child. The latter was stillborn, without instrumental aid, and probably in consequence of such aid not having been rendered. The fœtal heart had been well heard during labour. I examined the body eight hours after death, the late Dr. Angus Macdonald being present. There was a large quantity of serous fluid in the pleural and pericardial cavities and much uncoagulated blood in the right chambers of the heart. The foramen ovale was patent and the structure of the heart otherwise normal. Numerous patches of extravasated blood were observed under the pulmonary pleuræ. On section the lungs were seen to be much congested and presented numerous "apoplexies," varying in size. When placed in water they sank immediately to the bottom of the vessel. The highest point of the diaphragm was on a level with the sixth rib; the liver and spleen were darkly congested and the rest of the abdominal contents healthy. The vessels on the surface of the brain were also much engorged with venous blood, but that organ was otherwise healthy, and on section the puncta cruenta were not very numerous. This may be regarded as an average example of the pathological conditions which characterise these cases, although Schantz, as I think somewhat theoretically, endeavours to discriminate between stases primarily due to attempts at intra-uterine respiration and those attributable in the first instance to compression of the funis, and even distinguishes mixed cases in which both these factors play a part.[2] It is conceivable, as he suggests, that in perfectly apnœic cases (which are rare), in which the cord is compressed, the vascular pressure may be first raised in the systemic arterial system, but we must not forget that such compression not only prevents the outflow by the umbilical arteries but also diminishes the inflow by the umbilical vein, and that only a moiety of mature fœtus will, under the circumstances, refrain from those attempts at respiration which attract the blood lungwards. Hecker[3] found much the same pathological conditions in six necropsies which he relates. Doubtless at times the pathological evidence of vascular engorgement, including the effusion of blood, is more pronounced in some parts than in others, and the locality of such serious derangement is important as determining the probable recovery of the child from the condition of apparent death. Thus Schultze[4] mentions effusions of blood on the surface of the brain and into the spinal canal, as well as into the intestines. It can be readily understood how a considerable effusion into the latter may be comparatively harmless, while much less in the former situations may prove fatal. Attempts at respiration in utero, in the absence of air, necessarily result in the aspiration into the air passages of the uterine contents, including it may be meconium. The very presence of the latter in amniotic fluid is regarded by some as evidence of an advanced stage of asphyxia neonatorum, except in those cases, such as breech presentations, in which mechanical squeezing can account for it. The aspiration of this material may determine the ultimate issue of a case by provoking an irritative pneumonia by occlusion of the smaller bronchi or bronchioles. "In rare cases," Schultze remarks,[5] "there is no proof of aspirated substances, in which case we must suppose that the intra-uterine respiratory movements have taken place with obstructed respiratory openings. In these cases the blood distribution, especially capillary extravasations, are

[1] A continuation of a paper commenced in THE LANCET of Feb. 24th, 1894.
[2] Pflüger's Archiv für die Gesammte Physiologie, November, 1888, p. 264.
[3] Verhandl. der Gesellsch. f. Geburtshilfe in Berlin, Heft 7, p. 112, 1853.
[4] Gerhardt's Handbuch der Kinderkrankheiten, vol. ii., Art. Asphyxie
[5] Loc. cit., p. 21.

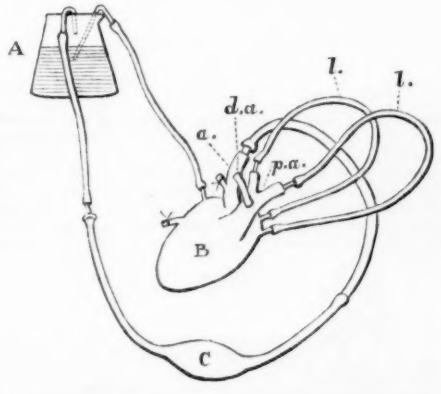
particularly well marked. If these also are absent the rarest event has been reached—namely, that the dead child has made no respiratory effort." The fact also—which the experience of many must have taught them—that children are frequently born of normal colour and activity who give evidence (bronchial râles) of having attempted to breathe before birth also proves that such attempts do not necessarily involve asphyxia. As Schultze[6] says, "there is an asphyxia without intra-uterine breathing and an intra-uterine breathing without asphyxia." In other words, in the former case death has begun at the respiratory centre, and in the latter threatened suffocation has been averted. It cannot be doubted, also, that even extravasations of blood of a serious character must be capable of absorption, and the child of resuscitation and restoration to life and health, when we consider the frequency of a grave degree of suspended animation in the newly born, in whom the intra-uterine conditions must have been such as to cause some of the changes discovered after death in those who are stillborn. The general cause of these phenomena of obstructed circulation may be said to be, in great measure, interruption to the systemic outflow; but the argument from the adult to the fœtal circulation is not altogether applicable. In the fœtus, in addition to the propulsive force of the heart there is the purely hydrostatic influence of an elevated source of the circulating fluid—namely, the placenta. The pulmonary circulation, also, is undeveloped, and therefore a purely retrograde explanation of the thoracic subserous extravasations is insufficient. The failing heart, and, in cases of compressed cord, the interrupted arterial outflow, may account for excessive repletion of that organ and the venous system generally, but do not suffice to explain all the phenomena observed.

Krahmer,[7] who was one of the first to note and to explain the pulmonary changes, but whose original work I have been unable to consult, gives a simple and fairly sufficient explanation of them, which is quoted by Hecker,[8] to the effect that "under normal circumstances, on each inspiration, air and blood stream at the same time into the lungs, induced by the widening of the chest. If, now, inspiratory movements take place without the entrance of the former, the disproportion between the volume of the air passages and the capacity of the thoracic cavity is equalised to a certain extent by a more powerful access (Zufluss) of blood, and, on account of the thin walls of the capillaries, some burst, and blood in small quantity escapes, and this agrees with the fact that neither in adults nor in larger children is anything of the kind observed." This argument is also rather strengthened by the fact that the nearest approach to such a condition in larger children is the minute injection of serous surfaces observed after death in cases of cardiac malformation with cyanosis; subserous extravasations may, however, take place under other circumstances, as when sudden death takes place in heart disease. But in the latter instances these are by no means so constant or widespread as in asphyxia neonatorum. Schantz, also, still guided by the supposed closure of the ductus arteriosus on attempted respiration, accounts for these ecchymoses by the raised pulmonary vascular pressure.[9] Schultze's argument[10] assumes a diminution of external pressure (Aussendruck) on the total thoracic contents, a fall of pressure in the heart and vessels within the chest, a draining of the systemic vessels in the aortic territory, and he says that "the capillaries of the lungs alone, which in the total expansion (Ausdehnung) suddenly find themselves amid the lessened external pressure, become full."

I found myself most in accord with Krahmer's simple hypothesis, but, in order to determine the point more satisfactorily to myself, devised the experiments to be presently related. While aware of the rough-and-ready character of such schemata of the circulation, and of the fallacies possible in argument from the artificial to the natural, I would submit that the hydraulic as apart from the vital elucidation afforded by experiments with models is not without value and interest. Thus, from experiments with the sheep's heart and a simple arrangement of glass and indiarubber tubes I came to the conclusion that the aspirative power of the left ventricle after injection of the coronary system with water was 120 mm., and that of the right 30 mm.[11] This gives a relative negative pressure of right to left ventricle of 1 : 4. In the dog, Foster[12] states the intra-ventricular negative pressure as – 52 to – 20 mm. for the left and – 17 to – 16 mm. for the right ventricle, which, taking the maxima, yields a ratio of right to left ventricle of 1 : 3, a sufficiently close approximation to the results given by the dead heart and apparatus to impart a certain value to that simple method of investigating the purely mechanical factors. Von Basch, indeed, has recently written an exhaustive essay on questions of cardio-vascular physiology and pathology based upon experiments made with a model of the circulation.[13] Goltz and Gaule also bear testimony to the experimental value of the model in their well-known paper on intra-ventricular pressure in vol. xvii. of "Pflüger's Archives." The experiments, therefore, which I have made—in the manner to be described—have led me to modify my unreserved adhesion to any of the theories which I know to have been advanced in explanation of the phenomena in question. Of course, all the factors which play a part in the transformation of the intra-uterine into the extra-uterine circulation have their own place and influence. The question we have to determine is the relative power of these factors in the mature fœtus and newly-born infant, and also in what manner the influence of the most powerful, as the most important and vital of them, is to be fostered. Before we can do so we must naturally come to a conclusion as to the relative power of the factors concerned.

Experiment 1. (Fig. 1.)—In a sheep's heart (B) the curtain

FIG. 1.



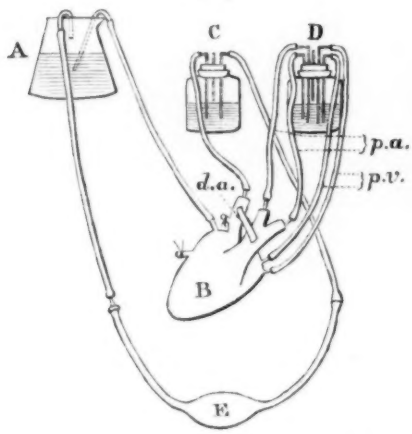
of the foramen ovale was removed. A piece of rubber tubing with the ends cut so as to occlude the lumen of the vessels as little as possible was inserted between the pulmonary artery and aorta just below the obliterated cord of the ductus arteriosus, and retained in position by sutures. The inferior vena cava was ligatured and a piece of glass tubing tied into the superior cava. Glass tubing was also tied into the two main branches of the pulmonary artery and into the pulmonary veins, and then these were connected by two pieces of rubber tubing. A piece of lead gas-pipe was tied into the free end of the aorta and the innominate artery ligatured. The proximal end of a Higginson's syringe (C) was then attached to the aorta, while the distal end of the syringe was continued by rubber tubing into a water-jug (A). The latter, representing the placenta, was placed at a higher level than the heart. On establishing the syphon by suction with C a few points in the vessels and auricles jetted, but were secured by ligatures, and the apparatus was rendered practically watertight. It was then found to work quite well, the heart being emptied by the diastole of the syringe and filling during its systole. The pulmonary artery filled immediately after expansion of the syringe first, and emptied last, the chief force of suction by C being felt by the aorta, which gained its main supply of fluid by way of the artificial ductus arteriosus.

Experiment 2. (Fig. 2.)—D is a glass jar with four glass tubes passed through its cork for attachment to the

[6] Virchow's Archiv, vol. xxxvii., p. 113.
[7] Handb. d. Gerichtlich. Med., 1851.
[8] Loc. cit., p. 158.
[9] Loc. cit., p. 284.
[10] Loc. cit., p. 17.
[11] Dextral Valvular Disease, p. 36.
[12] Physiology, p. 145.
[13] Allgemeine Physiologie und Pathologie des Kreislaufes.

pulmonary arteries and veins, and has a central tube for air. The jar represents the lungs and is filled by syphonic inflow more rapidly than C, another glass jar, having two tubes through its cork for attachment on the one hand to the aorta and on the other to the tubing representing the systemic arterial system. A central tube is also inserted through this cork to afford normal atmospheric pressure. In this experiment C emptied rapidly under the influence of the syringe (E), while the water in D was practically uninfluenced by the

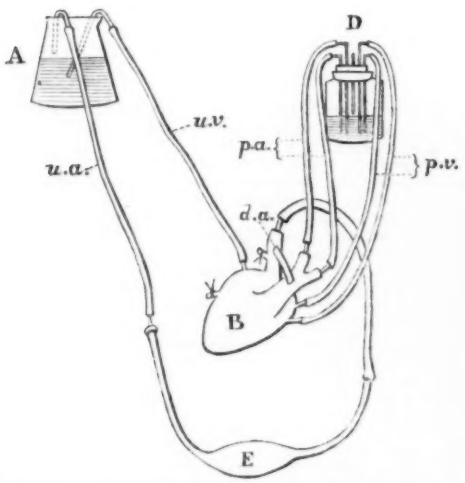
FIG. 2.



latter, showing that the aspirative force of E was incapable of affecting the fluid in D, representing the pulmonary circulation.

Experiment 3. (Fig. 3.)—If, however, the jar (C) be removed from the circuit and arterial connexion be made directly with the aorta, as in Experiment 1, D is slowly emptied by the action of E, which exercises its principal influence upon the aorta by sucking water through the arti-

FIG. 3.

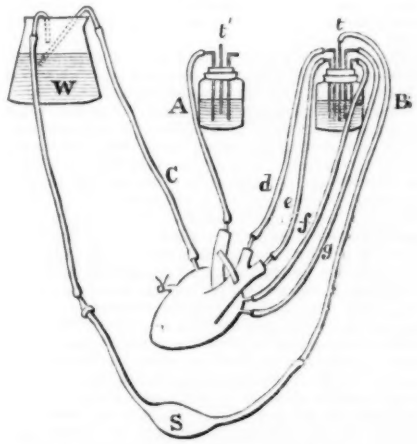


ficial ductus arteriosus, but also upon the aorta proper to a less extent. In other words, the action of the fœtal left ventricle has little effect upon the pulmonary circulation. The diastole or filling of the syringe (E) of course coincides with the emptying of the ventricles, and its systole with their filling by the syphon established; but, nevertheless, the negative pressure in the diastolic syringe likewise causes a diminution of pressure in the chambers of the heart.

Experiment 4. (Fig. 3.)—If *u v*, representing the umbilical vein, be compressed, no fluid enters D. If *u v* and *u a*, representing the umbilical arteries, be compressed after fluid has been allowed to enter D, the latter remain stationary. If *u v* be compressed and E worked, fluid is removed comparatively quickly from D. If *u v* and *u a* be left uncompressed and E be worked, fluid enters D more quickly than it can be removed by E. If *u a* be compressed, there is an increase of tension or of pressure first felt by E and the arterial system, and the action of E in evacuating D is arrested. If under these circumstances *u v* be also compressed, the water level in D remains stationary after the fluid has gained its proper level by percolation through the various cardiac and pulmonary vascular openings—that is, compression of the cord in nature implies arrested inflow as well as outflow.

Experiment 5. (Fig. 4.)—In this experiment the syphon action from W was established by the syringe S effecting a partial vacuum in B *t*, when fluid passed very readily into B, but did not sufficiently enter A for the purpose of the experiment. This may be taken to have represented the effect of full pulmonary respiration in closing the ductus arteriosus. While the stream through the established syphon was running towards B, the syringe had to be temporarily attached to A *t'* to fill it sufficiently by way of the artificial ductus arteriosus for experimentation. When a sufficiency of fluid had accumulated in both A and B, the syringe S was again attached to B *t* and the heart, H, raised so

FIG. 4.



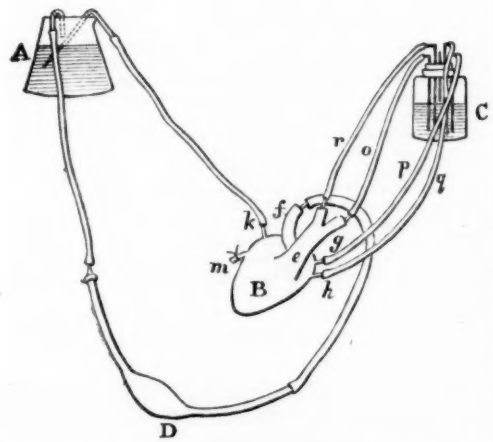
as to prevent the fluid in A and B returning to a lower level. C, representing the umbilical vein, was then grasped to prevent the entrance of more fluid into A and B by way of H. When, now, a partial vacuum was effected by means of S in B, fluid in all vessels directly and indirectly connected with B was urged towards the vacuum, because there was no sufficiently powerful counteracting vacuum in H such as would in some degree have been produced by attaching a syringe to A *t* and closing A *a*, representing the systemic arterial circulation. As I argued on a former occasion,[14] the aspirative power of left ventricular diastole (negative pressure) is great to overcome the retentive power of the thoracic vacuum, and as during each respiratory act this diastole occurs about four times this number seems necessary to maintain the continuous flow of the pulmonary blood pumped into the lungs by an equal number of systolic contractions of the right ventricle, aided by thoracic action. The effectiveness of diastolic aspiration in a particular direction is in proportion to the absence of openings through which aspiration can be exerted in other directions. The diastolic aspirative power of the left ventricle is diminished in the fœtus by the presence of the foramen ovale kept permanently open by the preponderant pressure in the right auricle and by the smaller capacity of the ventricle itself, which has less propulsive power than it has extra uterum. In the adult, therefore, a single respiration has probably the retentive

[14] Dextral Valvular Disease, p. 38.

power of about four left cardiac diastoles, and suction is related to the size and perfection of the vacuum. In the fœtus the absence of a pulmonary thoracic vacuum does away with the necessity for a counteracting left ventricular aspiration, but attempts at respiration have on this account a more lasting attractive force, although, as I shall have occasion to suggest presently, the current from the pulmonary artery into the aorta through the ductus arteriosus may have some influence in correcting minor degrees of repletion of the pulmonary vascular system in the fœtus.

Experiment 6. (Fig. 5.)—The inferior cava (*m*) is tied; the inflow is from A through the superior cava (*k*); the ductus arteriosus, between the pulmonary artery (*e*) and the aorta (*f*), is obliterated; the foramen ovale is still unclosed; C is the lung bottle with inflow through the pulmonary arteries (*r*, *o*) and outflow through the pulmonary veins (*p*, *q*); D is the syringe. On establishing the syphon, C filled much more rapidly than it could be emptied. Indeed, vigorous action of the syringe, which was difficult from its tendency to collapse under external air pressure (the "Aussendrück" of Schultze), could only slightly arrest inflow into C. This could be done somewhat better on substituting a powerful brass syringe for Higginson's. The effect was thus in proportion to the aspirative power, and accumulation or stasis was therefore dependent upon defective outflow along systemic vessels. The closed ductus arteriosus in this experiment had an appreciable influence in maintaining the fulness

FIG. 5.

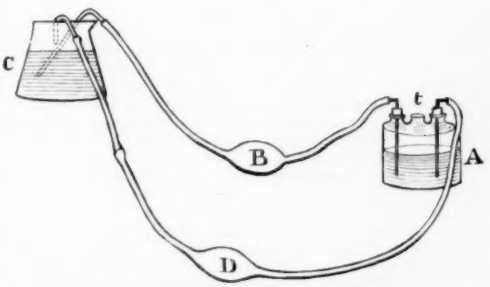


of C. In Experiment 3 the lung bottle could be slowly emptied by the syringe, but not so here. In that experiment this must have taken place in a measure by retrogression of the fluid down *r* and *o*, as well as from diversion of the flow towards the lung bottle by the action of the syringe upon the ductus arteriosus. In nature this cannot occur, from the action of the diastolic right ventricle when the pulmonary valves are perfect, but it is conceivable that the removal of engorgement due to attempted respiration in utero may to a certain extent be effected by the attractive influence of the onward current through the reopened or widened ductus arteriosus. Is then the occurrence of lung ecchymoses due mainly to closure of the ductus arteriosus, as Schantz argues, or chiefly to defective action of the left ventricle? This remains to be considered.

Experiment with the perfect heart was not made, because deemed unnecessary after the results of Experiment 6. It could only have shown a slightly improved left ventricular aspiration. Injecting the coronary circulation would also have increased the capacity of the chambers of the heart and thus have facilitated relief of stasis in the lung bottle, but the action of the syringe would have tended to aspirate fluid from these vessels, and their injection was not therefore undertaken.

Experiment 7. (Fig. 6.)—If now, instead of using the natural heart, a Higginson's syringe (B) be made to represent the right heart, and another, D, the left heart, the former pumping water into the lung jar A at each compression, and the latter withdrawing it at each expansion, the fluid will rise and fall rhythmically like an equal respiration, as much water being abstracted as flows in, and no over-accumulation taking place.[15] By closing the central neck *t*, representing the trachea, and thus increasing external pressure, the phenomena of pulmonary congestion and plethora of the venous system may also be demonstrated with this apparatus, the fluid accumulating more rapidly in the lung bottle than it can be removed, and the readmission of air, with lessening of external pressure, again restores the balance of the circulation[16] and allows of the removal of excessive accumulation in the jar representing the pulmonary circuit. The latter part of this experiment, however, applies rather to extra- than intra-uterine respiration. The new-born child which cries lustily immediately after birth, even when the cord is pulsating powerfully, does not become cyanotic either before or after the cord is tied. The left heart is capable of dealing with the inflow of blood from the placenta by way of the right heart, as the syringe (D) in Experiment 7 can deal with the water in the lung bottle, although there is reason to believe that for some days the whole of the blood sent during fœtal life through the ductus arteriosus to the aorta and that passing through the foramen ovale into the left ventricle are not at once diverted towards the lungs. The latter orifice is, however, probably more perfectly closed than the former. What, then, are the factors which so readily transform the fœtal into the extra-uterine circulation? And what is their relative power or importance? With the act of aerial respiration there is a great increase of thoracic capacity, with lessening of extra-thoracic pressure, although this increase may not immediately reach its

FIG. 6.



greatest extent. Hermann has demonstrated by a very simple caoutchouc apparatus and air pump[17] that such a thoracic increase implies not only pulmonary but also, to a less extent, cardiac expansion. This has also been observed at high altitudes and in a rarefied atmosphere in the case of the human heart. The large diversion of the blood current lungwards lowers pressure in the right chambers of the heart, commencing with the right auricle. The auricles, being thin, also probably respond to the influence of lessened external pressure more readily than the ventricles.[18] The stretching of the ductus arteriosus described by Schantz[19] narrows that channel, which, nevertheless, for a time remains pervious and permits of the passage of blood. Increased cardiac capacity involves increase in the capacity of the left auricle and ventricle, and the latter especially is enabled to exercise all its increased aspirative power on the pulmonary circulation, because, unlike the valveless ductus arteriosus, blood entering the left auricle finds a perfect valve over the left side of the foramen ovale, more than sufficient to close it, and capable of instant and perfect closure, although not yet permanently sealed. The fall of intra-cardiac pressure in the right chambers favours this perfect closure of the foramen ovale and thus fosters more remotely the influence of the negative pressure of left cardiac diastole. In addition to the mere prevention of reflux from the left auricle, and in addition, also, to its increased capacity, there must under these circumstances be so notable a fall in left

[15] Ibid., p. 41. [16] Loc. cit.
[17] Text-book of Physiology, translated by Gamgee, p. 160.
[18] Hermann, op. cit., p. 160; Broadbent, The Pulse, p. 123.
[19] Loc. cit.

intra-auricular pressure that the comparative vacuum so created must at once give an impulse *a fronte* to the pulmonary circulation held in comparative abeyance while the full force of the blood current, directed by the Eustachian valve through the foramen ovale into the left auricle, was in operation. Marey[20] concludes, without direct experiment, that the left and right intra-auricular pressure are practically the same and gives the maximum pressure in the right auricle of the horse as 2·5 mm. In not determining the left intra-auricular pressure he remarks that the difficulty of doing so seems to exceed the importance of a parallel determination. That the difficulties are great must be conceded; but that the importance of accurate knowledge in this matter is unimportant may be questioned. Considering the great size of the vessels entering the right auricle as compared with those which enter the left, and also the notable difference in the positive and negative pressures of their respective ventricles, it is legitimate, even without positive evidence, to conclude that the left must be considerably less than the right intra-auricular pressure. Both in the newly-born infant and in the adult we regard this very probable fact as of the highest importance in its scientific and practical bearings. A satisfactory thoracic vacuum brings this factor into play.

Waller[21] states that "the maximum systolic pressure in the left and right auricles amounts to about 5 and 2 centimetres of mercury respectively." It is not stated by what method of experiment this calculation was obtained; but as the negative is proportionate to the positive pressure it follows that the negative pressure, or suction power, of the left auricle must be greater than that of the right auricle. As, moreover, the negative pressure in the right ventricle, corresponding to a positive pressure of + 6 cm., is − 1·5 cm.,[22] it is fair to infer that the negative pressure, corresponding to + 5 c.m. in the left auricle, is about − 1 cm., while that in the right auricle, corresponding to + 2 cm., is less than − ·5 cm., or practically inappreciable, and of little suction power. Any method of investigation, however, such as the passage of a manometer sound through the mitral valve, would, we believe, vitiate the result by transmitting during systole some of the left intra-ventricular pressure to the auricle. On *a priori* grounds, and from anatomical considerations, we should have expected to find a permanent lowness of pressure in the left auricle under normal circumstances.

As Dr. Robert Barnes remarks, "it is one of the most remarkable and gratifying illustrations of the phenomena of respiration and circulation to observe how quickly the bloated, cyanosed aspect of the face vanishes, giving place to a healthy hue when a good respiration takes place."[23] Now, to throw more blood into an imperfectly expanded lung, incapable of perfect relief by left cardiac action, would be but to engorge it were the ductus arteriosus closed. When, therefore, Schantz regards the beneficial action of artificial respiration in asphyxia neonatorum as mainly due to that manœuvre closing that fœtal channel, we believe, to use a homely phrase, that he places the cart before the horse and sacrifices reason and the teaching of experiment (Erichsen) to a preconceived notion. There can, however, be no doubt that every production of thoracic vacuum, natural and artificial, causes an increased flow of blood into the heart by way of the venæ cavæ, and we are inclined to believe that the considerable quantities of serous fluid found in the pleural and pericardial cavities in some of these cases[1]—as, for example, in the one which I have related—is due also in part to the influence of direct aspiration during attempted respiration, as well as to the passive relief which follows plethora.

The act of respiration, then, with lessened external pressure and expansion of all the thoracic contents, we regard as of the first importance—as the most powerful factor in the development of aerial respiration. As the particular event next in power and importance to this we should place the increased capacity of the left cardiac chambers, especially the left ventricle, and the perfect closure of the foramen ovale from within and the fall of pressure in the left auricle. As the last and least important factor under normal circumstances we consider the narrowing of the ductus arteriosus. It is, in fact, important that the latter should *not* be closed for some days, and we believe there is evidence, anatomical and physiological, that it is not so closed. This argument is supported, moreover, by a study of cyanosis due to cardiac malformation. The communication which in such cases exists between the chambers of the heart and between the ventricles or auricles, or both, diminishes the aspirative efficiency of sinistral negative pressure and the normal repletion of the arterial system. With this, progression in the pulmonary circuit and in the systemic capillaries alike is impeded. The latter may be shown by sphygmographic tracings,[24] the former by physical examination of the chest. The obstruction being thus extra-cardiac, it is a matter of little surprise that examination of the heart by auscultation should in these cases so often give a negative result. As in the case of the fœtus, the impediment within the heart is often, we should say usually, not such as to originate bruit. The fœtal heart has no bruit either in utero, or in conditions of suspended animation extra uterum in which fœtal channels remain open, as in most cases of cardiac malformation. Dr. Walshe[25] has endeavoured to indicate the probable signs of a persistent ductus arteriosus in the adult, but confesses he does so on purely hypothetical grounds.

Although thus, under normal circumstances, the last and least important of the events involved in the beautiful circulatory transformation which takes place after birth, it does not follow that the condition of the ductus arteriosus is of little importance in utero. The temporary and partial diversion of the circulation lungwards on attempted respiration must rob the ductus arteriosus of its full complement of blood without materially affecting the other factors in the circulation. The increased blood-flow into the lungs, meeting with impediment in front from an insufficiently accelerated current due to defective left cardiac aspiration and propulsion, puts a pressure upon the pulmonary capillaries which they cannot withstand. Hence (except in the case of very transient plethora of the proximal portion of the pulmonary circuit) subserous extravasations of blood and bleeding into the lung tissue ensue. The cause, then, on this showing, of the characteristic ecchymoses of intra-uterine respiration is thoracic aspiration, unaccompanied by sufficient left cardiac action and associated in all probability with a minor degree of narrowing of the ductus arteriosus, which cannot, fortunately, be quite closed. The partial closure of this channel must be of a very transient character, because on post-mortem examination it is found to be patent, and there is often said to be a fairly equal distribution of blood in the right and left chambers of the heart from percolation after death.

Upper Berkeley-street, W.

[20] Circulation du Sang, p. 115.
[21] Human Physiology, p. 64, 1893.
[22] Waller: op. cit., p. 64.
[23] Obstetric Med. and Surg., p. 165.

ON THE

TREATMENT OF URINARY FISTULÆ BY SUTURE OR RESECTION OF THE URETHRA.

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MOST cases of urinary fistulæ occur as a complication of stricture of the urethra, and under these circumstances they usually close after the obstruction has been removed, either by dilatation or by the operation of internal or external urethrotomy. In some instances, however, they persist after the stricture has been cured, and in other instances when met with independently of stricture, they are often of a very obstinate nature, being extremely troublesome to heal. The usual treatment under these circumstances is to scrape or cauterise the track of the fistula, pare its edges and bring them together by means of sutures, or close its external orifice, when it is of large size, by some form of plastic operation. In two very obstinate cases of perineal urinary fistulæ recently under my care, the plan adopted has been to cut down upon the urethra and freely expose their internal openings. In one, where the urethral opening was of small size, its margins were pared and then accurately stitched together by deep sutures passed only through the wall of the canal. In the other, where the opening was much more extensive, involving a considerable portion of the urethral

[24] Morison, The Practitioner, March, 1888.
[25] Diseases of the Heart, p. 567.

floor, an entire segment of the canal was resected, and the proximal and distal portions, having been freed sufficiently to allow of them being brought into apposition, were sutured together. The margins of the wound in the overlying tissues in both cases were then brought together by another set of sutures, passed as deeply as possible, but not involving the urethral walls. In this way by attacking the source of the trouble—viz., by closing the opening in the urethra through which the urine escapes—the parts are placed in a more favourable condition for repair. The second case shows that primary union is not essential for success, and that complete healing may take place, even though a slight leakage of urine occurs after the operation.

Points of importance, to which attention should be paid in adopting this plan of treatment, are as follows:—1. Sterilise the urine as completely as possible previously to operation by the internal administration of boric acid or salol, and when practicable, by also washing out the bladder with some antiseptic, e.g., boric acid or perchloride of mercury, &c., in order that its contact with the wound may be rendered innocuous. 2. Separate the walls of the urethra freely from the surrounding tissues at the seat of operation. 3. In suturing the urethra include only the muscular coat, avoiding the mucous membrane, which should be inverted. 4. In closing the external wound, pass the sutures deeply, so that they may include all the tissues down to the urethra. 5. To prevent as far as possible the urine from coming into contact with the wound, either draw it off at regular intervals, or tie a catheter in the bladder, irrigating it frequently with some antiseptic fluid, especially if there is any tendency to cystitis or to septic changes in the urine.

CASE 1. *Urinary fistula; suture of urethra; recovery.*—The patient, a male aged thirty years, was suffering from an urinary fistula, the external orifice of which was situated close to the anterior margin of the anus; it had appeared shortly after an operation for fistula ani performed about five months previously. There was no stricture of the urethra, a full-sized instrument passing easily into the bladder. Though the fistula was twice scraped and cauterised, and the urine after each operation was regularly drawn off, it refused to heal. On Nov. 29th, 1893, the opening in the urethra, which was of small size and situated in the membranous portion, was exposed by laying open the fistula, and its margins having been freed and pared were brought together by several fine silk sutures. The external wound was then closed by deep silk-worm gut sutures, and the urine was afterwards drawn off by a soft catheter at regular intervals. Repair took place without any suppuration, no urine ever escaping through the wound, and the patient left the hospital at the end of a fortnight, micturition being in all respects perfect. When last seen some months subsequently, the part remained soundly healed.

CASE 2. *Urinary fistulæ; resection and suture of urethra; recovery.*—The patient, a male aged thirty-five years, was sent by Dr. Barwise of Southport, suffering from urinary fistulæ of about eight years' duration, secondary to a stricture of the urethra, following gonorrhœa. For the cure of the fistulæ, he had at different times been under the treatment of several surgeons, and though he had undergone the operations of both external and internal urethrotomy, the fistulæ, which had also been laid open and cauterised, had never healed. When he came under observation, there were two fistulous openings, one on the right side, the other in front of the anus, through both of which the urine escaped during micturition, causing the patient great inconvenience. The stricture, which was still present, would only admit of the passage of a No. 5 English catheter. On February 13th, 1894, internal urethrotomy was performed, and the stricture dilated up to 12·15 Lister's sound. The fistulæ were laid open down to the urethra, and an attempt was made to suture the opening in the canal, which was single and situated at the bulbo-membranous portion, but this was found to be impossible on account of its large size and the indurated condition of the peri-urethral tissues. The urine was afterwards drawn off regularly and the stricture kept dilated up to No. 12 (English size), in the hope that the fistulæ would close, but without any effect. It was therefore resolved to resect the urethra, where the internal orifice of the fistulæ was situated, and then suture together the two ends of the canal.

On April 26th a full-sized staff was introduced into the bladder and the bulbo-membranous portion of the urethra was freely exposed by a median perineal incision. This portion of the canal, including the fistulous opening, which involved the entire floor for about one third of an inch of its length, was freely separated from the surrounding parts, this proceeding being somewhat difficult on account of the indurated condition of the peri-urethral tissues. About two-thirds of an inch of the urethra, including the fistulous opening and the portion of the canal immediately in front which had been the seat of the stricture, was then resected, and the divided ends were carefully brought together by numerous fine silk sutures. The perineal wound was afterwards closed by deep sutures of silkworm gut. A full-sized silver catheter was tied in the bladder, but at the end of forty-eight hours it was removed at the patient's urgent request, as he could not tolerate its presence any longer, and the urine for the next fortnight was drawn off regularly by a soft india-rubber catheter. At the end of this period he was allowed to pass urine himself, a Lister's sound 9·12 being introduced into the bladder every four or five days. There was at first an escape of a few drops of urine through the perineal wound each time the urine was drawn off, and also during the first ten days after he began to pass urine himself, but the quantity gradually became less and less, until at the end of a month from the date of the operation the wound was completely healed, all the urine being passed by the natural route.

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SOME COMMON SOURCES OF ERROR IN TESTING FOR SUGAR IN THE URINE.

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IT has happened to me during the last quarter of a century or so to be consulted by a considerable number of patients who were being treated for glycosuria, but in whose urine I could find no trace of sugar. As these patients had been strictly dieted, and were taking highly nitrogenous food, to the exclusion, as far as possible, of saccharine and farinaceous materials, it might plausibly be supposed that the absence of sugar when the patients came under my notice was the result of the treatment. In order to test this they were directed to return to an ordinary mixed diet including sugar, sweet fruits and starchy food of all kinds. After a week or more of this diet the continued absence of sugar led to the conclusion that a mistake in the mode of testing for sugar had led to an erroneous diagnosis. In nearly, if not quite, all the cases to which I am referring the urine had the same general characters. The specific gravity was high, 1030 or more; there was an excess of urea, as shown by the large mass of crystals which resulted from the addition of an equal volume of strong nitric acid to the urine, the mixture being stirred with a glass rod and afterwards cooled, while an analysis indicated as much as 3 per cent. of urea. In none of the cases had there been excess of urine, thirst, or other symptoms of diabetes. The cases, in fact, come under the designation of azoturia. The power of digesting and assimilating nitrogenous food is impaired, there is an excessive excretion of urea, and, as I shall presently show, of other nitrogenous products by the kidneys. Obviously they are not cases in which a highly nitrogenous diet is likely to be beneficial, but rather the reverse; so that, as often happens, a wrong diagnosis suggested an erroneous method of treatment. Now in all these cases, with one exception, the copper test had been used, either Trommer's process or Fehling's solution. In the one case a highly albuminous urine had been boiled with liquor potassæ (Moore's test), and the dark colour resulting from the combination of the sulphur of the albumen with lead in an impure specimen of liquor potassæ was mistaken for the brown colour produced by boiling potash with glucose. The explanation of the mistakes which have been made in using the copper test for sugar is to be found in the fact that all normal urines contain two substances which resemble glucose in their power of reducing the oxide of copper: these substances are uric acid and kreatinine.

Dr. Pavy[1] has shown that uric acid accounts for one-fourth of the reducing action of normal urine upon copper solution, and he suggests that the remainder of the reduction is due "to the small amount of sugar naturally present in the

[1] Med. Chir. Trans., vol. lxiii.

urine." "It is doubtful," he says, "if there is any other body worthy of consideration to exert any possible reducing effect." My son, George Stillingfleet Johnson, Demonstrator of Chemistry in King's College, confirms Dr. Pavy's observation with regard to uric acid, but he has further made the interesting and important discovery that the remaining three-fourths of the reduction is due to kreatinine. In short, he has shown that uric acid and kreatinine together account for the whole of the reduction which is effected by urine upon copper solutions, and that no trace of glucose is to be found in normal urine.[2] The details of my son's investigations are to be found in a very elaborate paper in the Forty-third Volume of the Proceedings of the Royal Society, p. 493, while the results are more briefly recorded in his paper on "The Absence of Sugar from Normal Urine" in the Seventy-sixth Volume of the Royal Medical and Chirurgical Transactions.[3] The success of his investigation is mainly due to the fact that he has done what had never before been accomplished—by mixing mercuric chloride with urine he not only separates the uric acid, but he obtains the whole of the kreatinine in combination with mercury as a definite chemical compound. The mercurial salt being analysed, he finds it to contain one-fifth of its weight of kreatinine, and the kreatinine thus separated in a beautiful crystalline form has had its ultimate composition accurately determined. The uric acid and the kreatinine having been removed by the mercuric chloride and the excess of mercury got rid of by ammonia and subsequent filtration, the filtrate is found to have no reducing power upon a copper solution or upon picric acid. That the separation of the kreatinine by the mercuric chloride process does not remove any glucose that might be present is proved by the fact that when a known quantity of glucose is added to normal urine it is found undiminished after the removal of the kreatinine.

It will, perhaps, be remarked, that there is no novelty in the separation of kreatinine from urine by means of mercuric chloride; but a careful perusal of my son's papers will reveal much that is new. Thus, the following processes are entirely original: 1. The kreatinine is separated by *fractional precipitation* with mercuric chloride. The uric acid &c. are precipitated first and removed at once by filtration, whilst a *pure* compound of the mercuric chloride with the kreatinine separates from the filtrate on standing. 2. Throughout all the processes adopted in preparing the pure urinary kreatinine no heat is employed. 3. As a result of these novel methods of procedure the kreatinine obtained is really a new base—i.e., its properties are entirely different from those of any kreatinine hitherto described, and not the least striking difference consists in its much more active reducing properties.[4] It was his discovery that the kreatinine in normal urine is sufficient to account for the total reduction of picric acid when that agent is used as a test, and for three-fourths of the reduction of cupric oxide, the remaining fourth being due to uric acid, that led to the conclusion that no sugar is present in normal urine. Additional evidence of the absence of sugar from normal urine is afforded by the fact that the very sensitive phenylhydrazine test gives no indication of sugar in that secretion. It has been suggested that my son's researches would have attracted more attention if he had given a new name to the substance which he has isolated and analysed, but as it is isomeric with other kreatinines it is perhaps sufficient to distinguish it by the name of the "natural kreatinine of urine."

One advantage amongst others which the picric acid has over the copper test is that it is not affected by uric acid. The result is that the degree of reduction in normal urine is an exact indication of the amount of kreatinine present, and here we have a simple means of testing the accuracy of the results of my son's researches. This is done by comparing the colour resulting from the application of the test to the urine with that which results from testing an aqueous solution of kreatinine of the same strength as that indicated to be present in the urine; but it must be borne in mind that the reducing power of kreatinine is inferior to that of glucose in the proportion of 10 to 12, so that if the urine tested with picric acid gives a colour which, if glucose were the reducing agent, would indicate one grain per ounce, the kreatinine solution, to give the same colour, would have to contain 1·2 gr. per fluid ounce. If the reduction by the urine were 0·8, then as 10 : 12 : : 0·8 : 0·96. The amount of kreatinine would be 0·96 gr. per ounce, and experiment confirms the results of the calculation. One point, however, has to be noticed. When the colours resulting from testing urine and an aqueous solution of kreatinine of the same strength are compared, the former is usually seen to be very slightly darker. The difference, which is so small as to be incalculable in amount, is due to the colouring matter in the urine, which may be removed by filtering through animal charcoal before applying the test. A very simple experiment shows how minute a quantity of urinary kreatinine suffices to give the characteristic red colour with the picric acid test. A drachm of a saturated solution of picric acid is mixed with an equal quantity of water and half a drachm of liquor potassæ (P.B.). The precipitated picrate of potash is dissolved by raising the mixture to the boiling point. The result is a liquid of a slightly darker yellow colour than the cold and undiluted picric acid solution, but without the slightest tinge of red.[5] If now a single drop of a solution of kreatinine, in the proportion of one grain to the fluid ounce, be allowed to trickle down the side of the sloped tube into the liquid a bright red colour is rapidly diffused from the top to the bottom of the column of liquid. It may be that the readers of this paper would find it difficult to obtain the genuine urinary kreatinine, which at present is not to be bought from any manufacturing chemist, but they will find that precisely the same result follows the addition of a drop of normal urine to the hot solution of picrate of potash. The proportion of kreatinine in an average specimen of normal urine and in a grain to the ounce solution of kreatinine is approximately the same, and the amount of the agent in one minim of the aqueous solution, as in one minim of normal urine, would obviously be no more than $\frac{1}{480}$th of a grain.

In using the picric acid test for glucose with a knowledge, which every practitioner should possess, of the reducing action of kreatinine upon that agent, it is scarcely possible to fall into the error referred to at the commencement of this paper—namely, that of supposing that sugar exists in urine which is quite free from that substance. When to a drachm of normal urine in a test-tube about half an inch in diameter is added an equal volume of a saturated solution of picric acid and half a drachm of liquor potassæ, the mixture immediately becomes red, owing to the partial reduction of the picric acid by kreatinine. Kreatinine differs from glucose in the fact that in the presence of potash it exerts some reducing action on picric acid at the ordinary temperature of the air. When kept at the boiling point for a minute the colour is deepened, and in normal urine it may be such as to indicate what, if glucose were the reducing agent, would equal from 0·6 to 1·2 gr. per fluid ounce, as shown by the picro-saccharometer. I have repeatedly shown that a solution of glucose, in the proportion of two grains to the fluid ounce of water, when tested as above described, gives so dark a colour that no red light is visible through the middle of the column of liquid. If, therefore, a sample of urine having been thus tested, a bright red colour is transmitted through the full diameter of the test-tube when held up to the light, the reduction is due to kreatinine alone and no glucose is present. If, however, the colour is so dark as to indicate an amount of reduction equivalent to two or more grains of glucose, this is more than the largest proportion of kreatinine hitherto found in any specimen of urine would account for, and the presence of sugar is indicated. The amount of sugar can be determined after separating the kreatinine by the mercuric chloride process before described.[6] In illustration of this the result of an analysis of a urine of high specific gravity may be briefly stated. The specific gravity was 1035, colour normal; twenty minims added to two drachms of boiling

[2] Though neither sugar nor albumen is present in normal urine, a small amount of one, or even both, these substances is sometimes found in urine, unassociated, for a time, with other evidence of disordered health.

[3] The method employed and its results are described in Watts's Dictionary of Chemistry, edited by Morley and Muir, 1889, vol. ii., pp. 270 and 271; also in Bloxam's Chemistry, edited by J. M. Thomson and A. J. Bloxam, seventh edition, 1890, p. 687.

[4] The various modes of obtaining kreatinine from urine, and the contrasted properties of the different products thus obtained, are set forth in a table in Proc. Roy. Soc., vol. l., p. 291, and in Med. Chir. Trans., vol. lxxvi., p. 155.

[5] I once met with an impure specimen of picric acid which gave a red colour when boiled with potash, the liquid also being turbid. A simple test of the purity of picric acid as a test agent is to boil the solution with half its volume of liquor potassæ. The result should be a clear yellow liquid, neither turbid nor red.

[6] In two tables, at pages 502-3 of my son's Royal Society paper, the highest amount of reduction of picric acid in a large number of samples of normal urine is shown to be 1·2, and the lowest 0·6. In urine of high specific gravity the amount of kreatinine and the consequent reduction of picric acid are found to be increased, together with that of the other normal solids of the urine.

Fehling's solution gave a copious precipitate of suboxide of copper. The picric acid process indicated a reduction of 1·8 gr. per ounce. After the separation of the kreatinine by mercuric chloride the reduction was reduced to one grain per ounce, and this indicated the amount of glucose present. The high specific gravity was mainly due to excess of urea (3·1 per cent.), which formed a solid mass of crystals with nitric acid. The high specific gravity and the reduction of Fehling's solution, without a quantitative analysis, would naturally suggest that the urine must be highly saccharine, but, on the other hand, there had been no excess of urine, thirst, or other symptoms of diabetes. The process by which the natural kreatinine is separated from the urine unchanged by heat or other violent methods occupies forty-eight hours; but the mere separation of the kreatinine may be effected in a short time by the following method. Add to the urine one-twentieth of its volume of a saturated solution of sodium acetate and nineteen-twentieths of its volume of a saturated solution of mercuric chloride and filter.[7] Boil the filtrate for five minutes and filter. Remove the excess of mercury by a few drops of strong liquor ammoniæ and again filter. The filtrate will be free from kreatinine, and the amount of glucose, if any, can be estimated, bearing in mind that the urine has been diluted by its own volume of liquid. If the loss by boiling has not been made up by the few drops of ammonia, this must be supplied by adding water before the analysis is made. It scarcely need be said that in analysing diabetic urine, when the amount of sugar is large, there is no need to take account of the small amount of reduction due to kreatinine.[8]

Some years since[9] I published the fact that the urine of patients who are taking salicylate of soda is reddened by the picric acid test to a degree that might indicate from one to two grains of glucose per ounce. Cupric oxide is also reduced by the same urine as if by a small amount of sugar. I ascertained that the sodium salicylate has no reducing action upon either test. My son tested twenty-seven specimens of salicylate urine, and found that the reduction with picric acid ranged from 1·0 gr. to 3·0 gr. per ounce, the average being equivalent to 1·73 gr. of glucose. He finds that the reducing agent is neither glucose nor an excess of kreatinine. It is, no doubt, some product of the decomposition of sodium salicylate; but salicyluric acid, which is found in the urine of these patients, does not reduce picric acid. These urines give a deep violet colour with perchloride of iron, which would indicate the presence of some unusual substance in the urine even if it were not known that the salicylate was being taken.

I have lately examined the urine of a rheumatic patient who was taking fifty grains of sodium salicylate in twenty-four hours. The sp. gr. was 1032. Absence of sugar was proved by the negative result of the phenylhydrazine test. The picric acid test gave a colour equivalent to two grains of glucose per ounce. After separating the kreatinine by the quick process before described, the reduction colour in the filtrate was reduced to 1·2 gr. The absence of kreatinine in the filtrate was proved by the fact that no red colour occurred in the picrate of potash until the temperature reached the boiling point, and the presence of some product of salicylic acid in the filtrate, after the separation of the kreatinine, was proved by the violet colour with perchloride of iron. The indication of two grains to the ounce was due—0·8 gr. to urinary kreatinine, and 1·2 gr. to some product of the decomposition of salicylic acid. Chloral hydrate and chloroform, which are sometimes present in the urine, reduce cupric oxide, but have no action on the picric acid test.

My main object in the present communication has been to indicate some common sources of error in testing for sugar in the urine, and to recapitulate the main facts by which it has been conclusively proved that no sugar exists in the normal secretion. I may add that by means of the picro-saccharometer any practitioner may with ease, in the course of a few minutes, make an accurate determination of the mount of sugar per ounce or per cent. in a case of glycosuria.[10]

Savile-row, W.

[7] The quantities may be: urine, $\frac{3}{4}$ = 420m; solution of sodium acetate, 12m.; solution of mercuric chloride, 228m.

[8] The various modes of testing for sugar in the urine will be found fully described in the author's "Medical Lectures and Essays," p. 792 &c.

[9] Medical Lectures and Essays, p. 807.

[10] On referring to the advertising columns of THE LANCET it will be seen that the saccharometer, with directions for its use, may be obtained from C. E. Müller, 148, High Holborn

A NEW INSTRUMENT FOR SURGICAL DRAINAGE, AND A READY METHOD OF MAKING A SELF-RETAINING DRAINAGE-TUBE.

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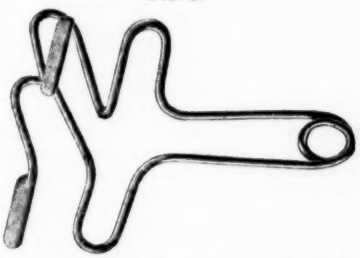
So to deal with the blood effused into operation wounds as to promote the primary union of the latter has always been a question of considerable difficulty to operating surgeons. At the discussion on the causes of failure in obtaining primary union in operation wounds at the International Medical Congress in 1881 many of the speakers referred to this point, and more particularly Professor Humphry of Cambridge focussed the discussion by remarking that "the great difficulty we have to contend with is the collection of blood and bloody fluid in the wound after it has been closed." I thought at that time that I had solved the difficulty by using elastic pressure by means of damp sponges.[1] Since then, mainly on account of the introduction of wood wool dressings, I believe that many surgeons have relied on pressure applied on the operating table as a means of preventing the hæmorrhagic oozing alluded to. With the best endeavours in this direction, however, I have not infrequently found my efforts unavailing, and this more particularly in certain regions of the body, as the neck, where it is impossible to apply strong pressure. But even in the case of amputation stumps I have met with disappointment. The alternative of the insertion of an ordinary drainage tube has not carried one much further, for, unfortunately, it happens that calling a thing a "drainage-tube" does not make it one. It almost invariably happens that the tube quickly becomes filled with coagulum, so as to effectually block up the drainage. The dressings contain only a small proportion of discharge, while the flaps become distended with that which is retained. This is evinced in the discomfort of the patient and the slightly raised temperature, and in consequence the wound has to be flushed, with diminished chances of primary union. This hæmorrhage takes place when the heart has recovered itself from the depression induced by the operative procedures, and probably in the great majority of cases ceases within an hour or two after the patient has been placed in bed. I have found that, to enable the blood to escape completely from the wound, it is sufficient to keep apart the lips of the latter for a short distance, and that it is quite unnecessary to place a tube or other contrivance deeply into its recesses. For some time past I have been using the simple contrivance which is here figured (Fig. 1). The principle of

FIG. 1.



it is that of the ordinary eye speculum. It is made of tempered steel, and the light spring enables the two hooks to be approximated, so as to render its introduction after the insertion of the sutures an easy matter.

After some experience the method I pursue is as follows. The wound is stitched in the ordinary way, except that, at the most favourable place for drainage, two sutures, though inserted, are only loosely fastened. All blood having been squeezed out, the hooks are inserted, and the dressings are then applied in the ordinary manner. Next day the wound is dressed, the hooks are removed, and the loose sutures are tightened up. What I then find is this: the dressings are heavy with sero-sanguinolent discharge, the flaps are flaccid,

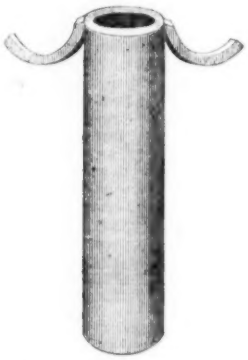
[1] Vide Transactions of International Medical Congress, 1881, vol. ii., p. 365; and THE LANCET, Oct. 15th, 1881.

and scarcely any discharge is to be obtained from the cavity of the wound, even with firm manual pressure. The part is then dressed anew and left alone for eight or ten days. This method of dressing I have now adopted as my routine practice in the case of large wounds, and I certainly think that it is more conducive to healing by primary union than any other which I have seen practised. In the case of small wounds I still rely on pressure, without provision for drainage.

The hooks have been made for me by Messrs. Weiss and Son, King-street, Manchester.

To make a self-retaining drainage-tube, as for an empyema, cut a ring one-sixth of an inch wide off the end of a large-sized drainage-tube; cut it across into halves (Fig. 2), and

FIG. 2.



then stitch with silver wire the end of one half on each side of the tube, close to the orifice, the convexity of the ring being applied to the side of the tube. When inserted in a cavity it is thus retained from falling out, in the same way as the winged self-retaining catheter.

Manchester.

SPINAL THROMBOSIS AND HÆMORRHAGE DUE TO SYPHILITIC DISEASE OF THE VESSELS.

BY R. T. WILLIAMSON, M.D., M.R.C.P. LOND.,

MEDICAL REGISTRAR, ROYAL INFIRMARY, AND ASSISTANT IN MEDICINE, OWENS COLLEGE, MANCHESTER.

THOUGH hæmorrhage and thrombosis are so common in the brain, these conditions have been very rarely met with (pathologically) in the spinal cord, and until recently but little attention has been paid to thrombosis in the spinal bloodvessels. From the frequency and importance of cerebral thrombosis one would expect that thrombosis in the spinal vessels would also play an important part in diseases of the spinal cord; but as yet the pathological evidence on this point is very small. Hence the pathological changes in the case described below appear to be worthy of record. I am indebted to the kindness of Dr. Steell for the opportunity of making the pathological examination.

The patient was a man aged twenty-eight, who was admitted under the care of Dr. Graham Steell at the Manchester Royal Infirmary on Sept. 22nd, 1893. About one month previous to admission the patient began to suffer from pains in the back, under the left scapula. There was sometimes pain under the right scapula; sometimes pain extended round the left axillary region, and as far forwards as the cardiac region. The pain was not severe, but continued more or less until the onset of paralysis. On Sept. 20th he first noticed some difficulty in passing his urine, but at that time he could walk quite well and had no pain. In the evening his gait was unsteady. Early in the night, after going to bed, he felt a desire to micturate. He got up, but found that he was quite unable to pass his urine. He was able to walk fairly well, and went downstairs for a short time. He then returned to bed and fell asleep. On awaking in the morning he found that both legs were paralysed. He could just "put the legs together," but could not stand. He stated that there was loss of feeling in the legs. There was no pain anywhere and no girdle sensation. There had been loss of control over the rectum and retention of urine ever since the night of Sept. 20th. A catheter had been passed twice daily. There was no history of injury to the back, but there was a history of alcoholism and syphilis. Two years previously he had had a chancre followed by sore-throat and falling off of the hair, for which he was treated by a medical man with iodide of potassium.

On Sept. 25th both legs were completely paralysed; the limbs were flaccid. Knee-jerks, ankle clonus, and cremasteric, abdominal, and epigastric reflexes were absent on both sides. Very slight plantar reflexes were obtained. There was no paralysis of the upper limbs, intercostal muscles, or diaphragm. There was loss of sensation to tactile and painful impressions (to the head and point of a pin) on the legs and trunk as high as the sixth intercostal space. In this interspace there was impaired sensation, but in the fifth intercostal space, and in all parts above, the sensation to tactile and painful impressions was good. There was no band of hyperæsthesia, no girdle sensation, and no spinal curvature. There was complete loss of control over the rectum and retention of urine. The rate of respiration was 36 per minute. There was a large amount of expectoration, and submucous râles and rhonchi were heard all over the chest. Nothing of importance was detected in the other organs. The urine contained pus and a large amount of blood.

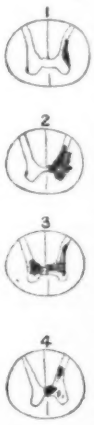
On Oct 3rd anæsthesia (to the head and point of the pin) extended as high as the sixth rib. There was now a zone of hyperæsthesia in the fifth interspace. The knee-jerks were absent. The urine contained blood and pus. The mental condition was very dull. On the 4th there was profuse diarrhœa and abundant expectoration. After admission rigors occurred once or twice daily, and the temperature was remittent or intermittent, high in the evening (on two occasions reaching 103° F.), lower or normal in the morning. A bedsore developed on the right buttock. The motions were passed involuntarily, and the retention of urine continued. The area of anæsthesia remained unaltered. The patient continued in much the same condition until his death on the 5th. Death appeared to be due to the pyæmic condition.

Necropsy (abstract).—Over the sacrum and right gluteal region were bedsores, and an old cicatrix was found on the glans penis. The brain was congested. The lateral ventricles contained a considerable amount of clear serous fluid. There were no signs of tubercle, syphilis, or other gross lesion. The lungs were congested and œdematous, but crepitant in all parts. The heart weighed 11 oz., and the valves were normal. The peritoneum was normal; the gastro-intestinal tract was congested. The liver weighed 4 lb. 4 oz., and was slightly enlarged. The spleen was enlarged slightly and weighed 10 oz. The kidneys presented well-marked signs of acute nephritis. There was also hæmorrhagic and suppurative pyelitis on both sides. The ureters were acutely inflamed and there was acute suppurative cystitis. The spinal cord showed no evidences of softening at any part, and was very firm and in exceedingly good condition. The meninges were congested, but no other naked-eye changes were detected on the surface of the cord. On section, about the middle dorsal region a hæmorrhage was found, occupying the whole of the grey matter of the cord on the left side. Scrapings from the cut surface of this part were examined in a 1 per cent. solution of osmic acid at the time of the necropsy, but no compound granular cells could be detected microscopically. The cord was not softened in the region of the hæmorrhage. No attempt was made to determine the limits of the lesion at the necropsy; the cord was placed to harden in Müller's fluid. After hardening, a number of transverse divisions were made in the dorsal region, and on naked-eye examination a large hæmorrhage, dark-brownish-red in colour, was found in the grey matter of the left side of the cord, about the mid-dorsal region. The vertical extent was about one inch and three-quarters (downwards from the mid-dorsal region). At both the upper and lower parts the hæmorrhage was limited to a small streak in the posterior horn (left). About the centre of the lesion the hæmorrhage occupied the whole of the grey matter of the left side, and extended across the grey commissure into the central part of the grey matter of the right side. For one inch below the inferior part of the hæmorrhage a few white points were seen scattered through the white matter of both sides; also a few white streaks were seen in the white

matter in some sections. The same condition was met with for about two inches above the highest part of the hæmorrhage. In the cervical and upper dorsal regions (above the lesion) the posterior columns presented the naked-eye appearances of ascending degeneration—i.e., these parts were paler than the rest of the white matter. To the naked eye there did not appear to be any descending degeneration below the lesion. The whole of the affected part of the cord (i.e., at the seat of hæmorrhage), was cut into sections (celloidin method), and every third examined. Altogether some hundreds of sections were obtained. Numerous sections were also taken a little above and a little below the seat of hæmorrhage, and in the cervical and lumbar regions. The sections were stained with logwood, aniline blue black, logwood and eosin, and according to Weigert's method.

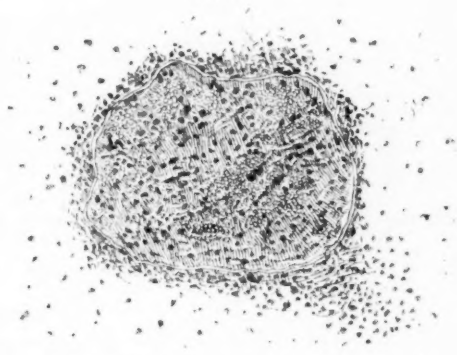
Microscopical examination showed that in the parts which, to the naked eye, appeared dark red (hæmorrhagic), the tissues were infiltrated and replaced by a mass of red blood corpuscles. At the highest part of the lesion, the hæmorrhage was limited to a small streak in the left posterior horn of grey matter; at a lower level it extended to the outer part of the grey matter (Fig. 1); a little lower it became more extensive, occupied the whole of the grey matter, and spread in irregular patches to the white matter of the left half of the cord (Fig. 2). Near the middle of the vertical extent of the lesion the hæmorrhage extended to the grey commissure, and then over to the grey matter of the right half of the cord, but never became so extensive in the right half of the cord as in the left, and occupied only the centre of the right grey matter (Fig. 3). At a lower level the hæmorrhage was confined to the grey matter of the left side (Fig. 4), and at the lowest part only a small streak of hæmorrhage was seen in the posterior horn. A few very small patches of hæmorrhage, chiefly around dilated vessels, were scattered irregularly in the white matter. Next to the hæmorrhages the most striking feature of the sections of the cord was the great number of enormously dilated bloodvessels, especially in the grey matter and the adjacent white matter of the left side at the seat of the hæmorrhage. Some of these vessels were equal in diameter to the breadth of the grey commissure. Dilated vessels were seen in the grey matter for a short distance above and below the hæmorrhage and also in the grey matter of the right side of the cord; but the most marked dilatation was seen on the left side in the region of the hæmorrhage. At one point, however, where the hæmorrhage was greatest—i.e., where it occupied almost the whole of the grey matter of the left side—only a few of these dilated vessels were seen. The vessels were packed full of red corpuscles, and very many were thrombosed. In the interior of these thrombosed vessels, close to the vessel wall, was an irregular layer of granular-looking substance (stained pink with eosin), containing many fine fibres, nuclei, and nucleated cells, whilst red blood corpuscles, with leucocytes, were seen nearer the centre. In some of the vessels this new-formed tissue occupied more than half of the lumen, and extended in an irregular manner to the centre. (Fig. 5.) The walls of these vessels were thickly covered with nuclei, and there was well-marked perivascular cell infiltration, the amount varying at different parts. A large number of these thrombosed vessels were surrounded by hæmorrhage. In a good number of sections, the anterior medial artery was obstructed by a thrombus. In a few sections, the central canal was surrounded by a zone of tissue crowded with nuclei; in others it was surrounded by hæmorrhage. Scattered irregularly in the white matter, in some of the sections, a few small patches were seen in which the interstitial tissue was a little in excess and its nuclei increased in number and size. As already mentioned, for two inches above and about one inch below the hæmorrhage, a few irregularly distributed white points and streaks were seen on the cut surface of the hardened cord, and microscopical examination showed that these were due to dilated vessels with marked perivascular cell infiltration. At no part of the cord were any compound granular cells to be seen; and the inflammatory changes—excess of nuclei and cell infiltration—were always just around the vessels. In all, even the upper cervical and lumbar regions, there were distinct changes in the meninges. These consisted of infiltration with round cells and marked vascular changes. The cell infiltration was only slight in the cervical and lumbar regions. The vessels of the meninges and of the cord showed distinct syphilitic changes; they were best marked, however, in the meninges. The walls of many vessels were greatly thickened. In many there was well-marked endarteritis—sometimes so extensive that the lumen was almost obliterated—and in a few arteries no lumen could be detected. Some of the arteries were obstructed by a thrombus. The adventitia was greatly thickened and infiltrated with round cells; there

FIGS. 1—4.



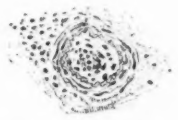
Diagrams of the spinal cord. Parts shaded = seat of hæmorrhage.

FIG. 5.



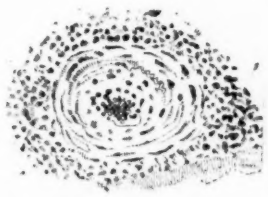
Greatly dilated and thrombosed vessel in the grey matter of the cord.

FIG. 6.



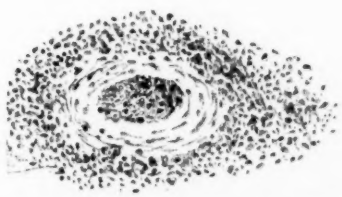
Small artery showing well-marked endarteritis.

FIG. 7.



Meningeal artery showing endarteritis and periarteritis.

FIG. 8.



Meningeal vein showing endophlebitis, periphlebitis, and thrombosis.

was also perivascular cell infiltration. Similar changes were met with in many of the veins—endophlebitis, periphlebitis, thrombosis. (Figs. 6, 7, 8.)

Pathological diagnosis.—Syphilitic disease of vessels (endarteritis, periarteritis, endophlebitis, periphlebitis); thrombosis; hæmatomyelia; leptomeningitis.

The onset of the symptoms in the case recorded above was not quite so sudden as is usual in so-called primary spinal hæmorrhage. The slight pain in the back for a month previous to the paralysis, the retention of urine, and the slight unsteadiness in gait for some hours previous to the actual paraplegia, together with the history of syphilis, appeared, during life, to be points against a primary hæmorrhage, and more in favour of a diagnosis of very acute myelitis. But the microscopical examination showed clearly that the primary change was syphilitic disease of the vessels, and that this was followed by thrombosis and hæmorrhage. There can be no doubt that the thrombosis of vessels occurred before the hæmorrhage and not as a result of it, because (1) though the thrombosis of the vessels of the grey matter was most marked in the dorsal region at the seat of hæmorrhage, and for a short distance above and below, yet thrombosed vessels were found in the meninges far away from the hæmorrhage, in the upper cervical and lumbar regions; (2) many of the thrombi were clearly of older date than the hæmorrhage; (3) there were marked vascular changes which alone would account for the thrombosis; and (4) the blood corpuscles in some of the thrombosed vessels were altered in shape, and some were broken down into granules, whilst the corpuscles in the hæmorrhage around were unaltered, and evidently the hæmorrhage was more recent than the thrombus.

The inflammatory changes—excess of nuclei and cell infiltration—were, as a rule, just around dilated vessels.

Though spinal thrombosis has been suggested by many writers as a primary cause of paraplegia of sudden onset in syphilitic patients, hitherto the pathological evidence has been slight. The pathological examination of the above case shows clearly that, in a syphilitic patient, paraplegia of sudden onset (with anæsthesia and bladder and rectal symptoms) was due to thrombosis in diseased vessels followed by hæmorrhage. The case is also of interest inasmuch as syphilitic disease of vessels and thrombosis are not usually included among the causes of hæmatomyelia in the descriptions of this disease.

Oxford-road, Manchester.

PHTHISICAL FAMILY HISTORY IN RELATION TO LIFE ASSURANCE.

BY THOS. GLOVER LYON, M.A. CAMB., M.D. LOND.,

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THIS important subject has long exercised the minds of life assurance medical officers. In former years extensive investigations were made by several authorities into the records of various hospitals, but a little consideration is sufficient to convince one that the data furnished from such sources is insufficient to form the basis for the solution of the problem. What is wanted in such investigations is the number of deaths occurring amongst a certain number of persons at risk; these factors cannot be obtained from medical records. The subject was next approached in another way by several assurance offices, notably by the Mutual Life Assurance Company of New York. In these cases it was scientifically conducted upon actuarial principles by the joint action of actuary and medical officer, but was limited to ascertaining the experience of the officers amongst lives which had given a family history of consumption "and had died of consumption." It will be evident that this method does not cover the whole ground. Persons who have a phthisical family history may well, and probably are, more liable to die than others from many causes other than phthisis, more especially chest affections. The results of these inquiries was to confirm the medical impression that hereditary consumptives are inferior lives, taking for granted that such a family taint does not give immunity from other dangers. The first attempt to investigate the subject under consideration by a complete method was, I believe, undertaken by Mr. Manly and myself during the years 1890 and 1891, and was based upon the records of the Mutual Life of London. In the appended remarks will be found a summary of the conclusions arrived at. Before giving the results of this inquiry it would be useful to consider certain points, as regards the applicant himself, generally considered to be important in the selection of lives, who may be suspected of being specially liable to consumption. They are: (1) physique; (2) conditions of life; (3) age. Without assuming the existence of a recognisable consumptive type, there is no doubt that delicate persons, more especially those who are weak in the chest, are specially liable to phthisis. The importance, therefore, of rejecting applicants of such constitutions will be evident. The reports of some offices appear to show that the weight of the applicant is an indication of his power of resisting the disease, those above the average weight being less liable than those below it. I believe that reliance upon the general impression of the medical examiner is preferable to trusting to any rules of this kind. The necessity of rejecting applicants engaged in pursuits whose conditions favour in them the production of phthisis need not be insisted upon.

Table showing the Mortality from Phthisis in England and Wales between 1871 and 1880, according to the Registrar-General; also the Mortality from Consumption in Three Life Offices—the Policies at Risk extending over 392,668 Years of Life.

Age at death.	Deaths per mille per annum.		
	Registrar-General.		Three offices.
	Males.	Females.	
20—24	3·09	3·14	2·0
25—34	3·70	3·54	2·29
35—44	4·12	3·34	2·28
45—54	3·86	2·46	1·93
55—64	3·19	1·78	1·79
20—64	3·45	2·91	2·06

From these tables it will be seen that the highest mortality from consumption in males, according to the Registrar-General, is between thirty-five and forty-five, decreasing only slightly as age advances, so that the percentage of deaths of those living between fifty-five and sixty-four is higher than that between twenty and twenty-four. This variation in mortality according to age is in great divergence from the impression in general acceptance. In New York the registered mortality from phthisis continues to increase with age until the end of life. In view of the well-known inaccuracy of registration in the British Isles (so well brought out recently by Mr. King and Dr. Newsholme with respect to cancer) it is open to question whether the diminution in the mortality from phthisis as age advances registered at home may not be due to errors of diagnosis consequent upon hesitation to regard as phthisical cases occurring in advanced life. It will be observed that there is no rise in the mortality amongst females corresponding to the climateric, and that the mortality from phthisis amongst insured lives varies much in the same way, according to age, as in the population generally. It has often been contended that the danger from consumption is much diminished after forty years of age, but in the face of these figures this must be taken with great reserve. The fact being that the danger from consumption diminishes only slightly with age absolutely, but relatively to the danger from other diseases, it diminishes quickly after about forty-five. This is important from an insurance point of view, as showing that consumption, speaking generally, becomes of less consequence as age advances. Our real concern is, however, with the extra risk alleged to attend a family history of consumption. Now the mere fact that a man has survived to the age of forty and is still in robust health, is evidence in itself that he was not born with a special liability to the disease. Indeed, I do not believe that, as a rule, much harm would be done by taking all applicants who had arrived at forty years of age, and who still remained of robust constitution, at ordinary rates. Deaths occurring from phthisis after forty-five should be regarded as accidental, and not due to any special susceptibility to the disease. But whether this view be the correct one or not can be determined only by actuarial investigation.

A reference to the table given above shows that during

insurable ages the mortality from phthisis amongst women, according to the Registrar-General, is much less than amongst men—2·91 against 3·45—so that, so far as risk from the disease is concerned, women are better lives than men. Whether the extra risk due to family history is less in women than in men is, of course, another question, and on the whole it would I believe, be best to make no difference between the sexes in the matter of selection.

Let us now pass on to the consideration of the effect of family history in relation to the subject of discussion. It is now proved beyond reasonable doubt that phthisis is caused by the entrance into the lungs and growth there of a specific micro-organism—in other words, that phthisis is a zymotic disease. As in the case of other diseases of this class, (1) the susceptibility to contract phthisis varies in different persons and in the same person, according to his age and the conditions of his life; (2) the degree of susceptibility to the disease is largely hereditary. The germs of infection are pretty generally scattered in civilised communities, although in some instances a concentration of infection occurs. In order to protect insurance offices from loss by the acceptance of applicants specially liable to phthisis, it has been the custom to form classes according to the varieties of family histories, and to charge various extra premiums upon applicants falling into those classes. These extras have up to now been fixed by the medical advisers, according to their opinions as to the extra risk involved; opinions upon no definite calculations; indeed, the data for such calculations were not in existence. Such a condition of things is obviously unsatisfactory, more especially as ample material is known to be collected in the London insurance offices to afford data with which, by actuarial methods, to ascertain the real extra risk involved in phthisical family history. The records of insurance offices do not give reliable information with respect to the cause of death of any relation outside the immediate family circle, so that we are forced to limit our inquiry accordingly. The fact that advance in age denotes small liability to phthisis applies equally to the relations of any applicant as to himself, so that cases of phthisis occurring in relations advanced in life are of less value in family history than those occurring in early life. From a medical point of view it would be valuable to distinguish between the various forms of phthisis in the parent. Unfortunately, it is impossible to separate cases recorded by assurance offices into these two classes. There are two theories pretty generally accepted, which call for notice. It is said that applicants whose parents have died of phthisis, who have passed the age at which their parents died of consumption, are less risky lives than those who have not done so. This is based upon the fact that the children of phthisical parents, if they succumb to the disease, on the average do so at an earlier age than their parents. But it is evident that those who have lived long enough to be parents will, on the average, be older than the general population, whether they die of consumption or not. Again, it is said that brothers and sisters who die of consumption, usually die about the same age, and it is argued that, in the case of a brother or sister having died of consumption, applicants who have outlived the age at which they died are better lives than those who have not done so. I doubt very much whether this is supported by facts. It is, of course, a common experience that in a family highly susceptible to phthisis several of the family will succumb to the disease early in life, say about twenty years of age. We are struck by this coincidence, and are apt to neglect the cases which do not conform to the rule and forget altogether the large number of persons, one of whose brothers or sisters die of consumption, and who never contract the disease at all. I am inclined to think that when we have said advance of age denotes small susceptibility to the disease, whether it be in the applicant himself or his relations, we have said the last word of importance in the matter, and that the respective ages of relations are of no value at all. It is said by some that death from phthisis in the mother is of more importance than in the father. The proposition is supposed to be supported by the alleged fact that more phthisical patients give a family history of death from the disease in the mother than in the father. Even if this were true, and authorities differ upon the point, it would prove nothing, for we have no record for comparison showing the proportion of fathers and mothers dying of consumption amongst the general population. Many causes would tend to make more mothers in general die of consumption than fathers, the most obvious one being that women marry earlier than men.

The following is a summary of the results of the investigation of the mortality experience of the Mutual Life Office, between 1847 and 1890, amongst those of its members who had given on entry a family history of consumption, or of death from childbirth in the mother. A large number of these in the earlier part of the period were taken at ordinary rates, and it is only recently that it was thought necessary to charge an extra on account of family history. These lives must therefore be looked upon as being, so far as personal examinations is concerned, of robust, physical condition. Family history was not recorded before this period at this office. The work of thus selecting all the policies containing a family history of phthisis was performed by myself, but in any future investigation it would not be necessary for the medical officer to go through this somewhat laborious though interesting work; it would be sufficient if a clerk was set to pick out all policies where the following causes of death appeared: consumption, phthisis, decline, debility, hæmoptysis, chronic pneumonia, tuberculosis. The medical officer might then look over the papers and mark those causes of death which might be safely considered phthisis. By this means a certain small part of the experience of the offices would be wasted, but the medical work of the investigation would be reduced to a minimum. The rest of the work, after it has been decided into what classes the cases should be arranged, is entirely actuarial.[1]

The question as to whether the excess of mortality amongst lives with a family history of phthisis, as shown by the Mutual figures, is due to excess of deaths from phthisis was not determined by Mr. Manly.

The deaths from phthisis amongst lives with phthisical family history are, as a matter of fact, in excess compared with those from other causes, being 14·12 against 8·5 amongst the general body of assurers in the Mutual between 1837 and 1890. This, however, proves nothing. The mortality from consumption, in all cases compared with that from other diseases, varies greatly according to the ages of those at risk. We thus find a very great difference between the percentage of deaths due to phthisis in different offices. In the Scottish Widows, 1815–1873, the percentage of deaths from this disease is only 7·58, whereas in the British Empire Mutual, between 1847 and 1878, it is 17·75. The question of the relative value of family history in lineals and collaterals is very interesting and somewhat difficult. The great difference in mortality according to the Mutual figures between the class in which one brother or sister only had died of consumption, and that in which one parent only had succumbed to the disease, does not really show that collaterals may be neglected in relation to the question under consideration. It suggests that collaterals are of little consequence where lineals are free from the taint; but in the cases where lineals were found to have died of consumption the occurrence of the disease or not in collaterals would probably be very valuable, as showing whether or not the taint has been handed down to the second generation. It should be remembered here that the history of the parents is more complete than the history of collaterals, so that many applicants who on entry give a history of one parent alone having died of consumption, if they survived and were examined later on, would often have to add a death of a brother or sister from the disease at an early age, and would then fall into the class having a history of phthisis in both lineals and collaterals. On the other hand, if a parent died of phthisis after the entry of an applicant it would be, as a rule, after forty-five, and would thus fall into the category of accidental cases. The favourable experience of the Mutual with regard to lives belonging to families apparently deeply tainted with consumption leads us to hope that, whatever the family history of applicants may be, careful examination is able to eliminate the greater part of those who are specially liable to the disease. In concluding his remarks before the Institute, Mr. Manly expressed the opinion that if a greater number of figures were collected together, bearing upon the point, it was not impossible that the extra risk amongst carefully selected lives having a family history of consumption might prove to be so small that it might be neglected altogether. It has long been the opinion of insurance medical officers that applicants whose mothers had died in childbirth are inferior lives; this opinion is supported by the experience of the Mutual as far as it goes.

Professor Westergaard has recently made an investigation

[1] See a valuable paper published by Mr. Manly in the Journal of the Institute of Actuaries.

into the mortality experience of hereditary consumptives insured in the National Life Office of London. It is a great pity that this observer has not put his results in the same form as those of the Mutual, so as they might be added to the Mutual experience. So far as they go they seem to agree, generally speaking, with the Mutual results. According to Professor Westergaard, the extra premium which should be charged on applicants giving a family history of phthisis is about a fourth of the general rates, corresponding to about four years' advance, this being very roughly about the amount deduced from the Mutual figures. The irregularity consequent upon a paucity of figures is well shown by the fact that in the National experience the chief excess of mortality in hereditary consumptives comes between fifteen years of age and thirty-five, whereas the maximum, according to the Mutual figures, is between thirty-five and forty-five. The following tables are abridged from Professor Westergaard :—

Persons with a Family Predisposition to Phthisis.

Age.	Actual deaths.	Expected deaths.
15—35	169	119·7
35—65	151	132·7

—	Actual deaths.	Deaths expected General Table.	Deaths expected according to Phthisical Table.
Two deaths from phthisis in family (males)	109	62	73
Three deaths from phthisis in family (males)	33	20	25

It will be seen that the extra mortality in the class where two or more deaths had occurred from phthisis in the family is greater than where only one such death had occurred. Here, again, the experience of the National differs from that of the Mutual, and we are prevented from drawing conclusions in this as in other points on account of the smallness of the figures at our disposal.

Summary.—Investigations into the experience of life offices, so far as they have gone, confirm the medical opinion that lives having a family history of consumption, even when selected, are below the average. Medical records contain no adequate data for determining the question of consumption in relation to life insurance. Several theories exist of an obstructive nature relating to the selection of lives having a family history of consumption. Examination of these theories show them to be founded upon insufficient data.

As the records of insurance offices contain the material for settling equitably the various questions belonging to this subject, it is advisable that an inquiry should be made based upon these records, and conducted jointly by actuary and medical officer. After the extra risk accompanying the different varieties of consumptive family history has been ascertained it will remain for the medical officer, guided by these results, to use his discretion in dealing with individual cases according to their special features.

Finsbury-circus.

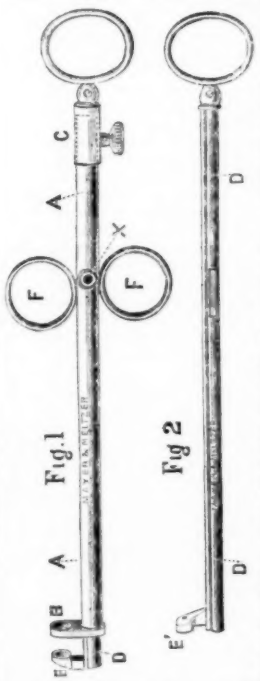
THE

TREATMENT OF CERTAIN CONDITIONS OF THE TONSILS BY MEANS OF A NEW TONSIL PUNCH.

BY A. BROWN KELLY, B.Sc., M.B. GLASG.,

SURGEON FOR DISEASES OF THE THROAT, NOSE, AND EAR, VICTORIA INFIRMARY DISPENSARY, GLASGOW.

IN ordinary cases of enlarged tonsils in which the glands project freely into the pharynx unconfined by the anterior pillars of the fauces, and in which there is no contraindication on account of the age, tendency to bleeding, or excessive nervousness of the patient, tonsillotomy is the best method of treatment at our disposal. Frequently, however, there is a departure in one or several respects from the above-mentioned conditions, and the tonsillotome then becomes more or less inadmissible. Under such circumstances we are compelled to adopt a slower procedure, and, as a rule, preference is given to cauterisation with the galvano-cautery point. If the tonsils are fairly large, three, four, or five sittings for each side are necessary in order to effect a sufficient reduction in their size; and, allowing a proper interval to elapse between each application, the treatment, when both tonsils are involved, will usually be found to extend over a period of from six to ten weeks. The cauterisation can be performed painlessly, but the patient usually suffers more or less for a day and a half, and for several days he should avoid everything likely to increase the reactive inflammation. Not infrequently, in spite of a moderate use of the cautery and the care exercised by the patient, an acute tonsillitis or pharyngitis supervenes with all its unpleasant accompaniments. The galvano-cauterisation of tonsils thus leaves much to be desired in so far as the duration of the treatment and the severity of the reaction are concerned; the tonsil punch about to be described has been designed with the view of diminishing these inconveniences. The instrument consists essentially of a grooved body and a central sliding part, the latter carrying a punch which works into a bolster fixed on the former. To allow of more delicate manipulation two punches — facing in opposite directions and each with its own central bar—have been made. For convenience they may be termed respectively the pulling and pushing punch. The body of the instrument is adapted for either. Fig. 1 represents the pulling punch complete: A A is the body, at one end of which the bolster (B) is fixed, while over the other the thumb-piece (C) is held by a screw; D is the central sliding bar carrying the punch (E), and into which the finger rings (F, F) are screwed. Fig. 2 represents the sliding part of the pushing punch. To change the pulling to the pushing punch the operator must remove C, unscrew F, F, and withdraw D; then slide D' D' into A A and screw F, F into the bosses (X), one of which is on each side of the body. The pushing punch is now complete. The changing of the punches may be effected in half a minute. The cases in which the tonsil punch may be used with advantage are those unsuitable for tonsillotomy, and in which hitherto the galvano-cautery has been indicated. They are as follows :—1. When the tonsils are enlarged antero-posteriorly, and project but slightly, if at all, beyond the pillars of the fauces. It is naturally assumed here, as also in the cases mentioned below, that the condition of the gland is giving rise to symptoms which call for its reduction—an enlargement *per se* does not justify interference. 2. When the anterior pillar of the fauces is stretched over the tonsil and there is danger of wounding it with a tonsillotome. 3. When, after tonsillotomy, the remaining portion of the gland is the seat of frequently recurring attacks of inflammation. 4. When there is chronic lacunar tonsillitis, and the gland is not sufficiently enlarged for tonsillotomy, the punch may be used alone, or together with discission. 5. When tonsillotomy is indicated, but the patient is an adult and excessively nervous, the punch may then be used with the assurance that the local anæsthesia induced by cocaine will render its application absolutely painless. In all the above cases the tonsil punch will produce the desired result more rapidly and with less subsequent pain and liability to severe inflammatory reaction than the galvano-cautery. I now make use of the cautery point only in the few cases in which danger is to be apprehended from bleeding. The mode of using the tonsil punch is as follows :—The parts are thoroughly anæsthetised with a



20 per cent. solution of cocaine. A careful examination—as recommended by Ruault—is then made to detect any adherence of the tonsil to the faucial pillars, and when present to break it down; this is best accomplished with Schmidt's tonsil slitter. The patient himself keeps down his tongue with a Türck's depressor, while the surgeon—holding back if necessary with a probe or tonsil slitter the anterior pillar of the fauces—applies the punch and removes a piece of tissue. This is repeated again and again until the desired reduction is effected or until the sitting has been sufficiently prolonged. The instrument is easily handled and is completely under control, so that pieces varying in size from a mere fragment to a small bean may be picked off. Each operator will have his own preferences as to the punch he employs for a particular purpose. Those using their right hand throughout will probably find the pushing punch, on the whole, best adapted for the right tonsil, and the pulling punch for the left. When working close to an anterior pillar its safety may be ensured by using the pulling punch and always keeping the bolster between the pillar and the tonsil; in a similar manner the posterior pillars may be protected while using the pushing punch. The bleeding is usually very slight, as might be anticipated from the manner in which the tissues are severed. Immediately after the operation the wounded surface may with advantage be painted with a 2 per cent. solution of pyoktanin. The subsequent treatment consists in the use of ice, antiseptic and astringent gargles, and soft food. In most cases slight pain is experienced only during the day of the operation. There is little or no inflammatory reaction, and in about a week the healing is complete. One or two sittings usually suffice for the reduction of a moderately enlarged tonsil, rarely are three necessary. The only other tonsil punch that has been brought before the profession, so far as I am aware, is Ruault's.[1] It is a large powerful instrument intended to take the place of a tonsillotome and constructed on quite different principles from those adopted in the punch above described. When the tonsil is prominent it is capable of doing good execution, but its size and shape do not allow of that operative precision which is essential in the majority of the cases to which I have specially referred. The instrument is made by Messrs. Mayer and Meltzer, 71, Great Portland-street, W.

Carlton-place, Glasgow.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

CONGENITAL ABSENCE OF BOTH PECTORAL MUSCLES ON THE RIGHT SIDE.

By H. LITTLEWOOD, F.R.C.S. Eng.,
HONORARY ASSISTANT SURGEON TO THE LEEDS GENERAL INFIRMARY.

A BOY aged ten came to the out-patient department of the Leeds General Infirmary on March 13th, 1894. Three days previously he had received a slight injury to the right shoulder. On taking off his shirt and examining the joint he suddenly discovered the deformity and exclaimed to his mother, "I have not got any armpit." The accompanying engraving (from a photograph) well illustrates the deformity. At the front of the chest, on the right side, all the ribs can be seen; they are subcutaneous and uncovered by muscle. No pectoralis major or minor muscles can be seen or felt. The coracoid process stands out very distinctly. There is a firm membrane attached to the inner end of the first rib and adjacent portion of the clavicle at one end, and at the other to the inner part of the tip of the coracoid process. The free margin of this membrane is well shown in the engraving. It becomes tense on drawing the arm to the side (this I take to be the costo-coracoid membrane). In this position of the arm there is also felt a slight ridge in the skin—like a strand of fascia—about the position of and corresponding to the anterior axillary fold. The other muscles about the scapulo-humeral articulation are much more developed than on the opposite side, and this is most noticeable in the anterior part of the deltoid and the coraco-brachialis muscles. The nipple is present and well developed. The joint is powerful and all the movements are good. Circumduction is much more free than on the opposite side.

In the museum of the medical department of the Yorkshire College there is a photograph of a similar case observed by Dr. Barrs—that of a man with both pectorals absent on the

right side. The nipple is present on this side. Mr. Hutchinson in the last number of his Archives describes a case he has noticed, and gives a list of fourteen other recorded cases. I hope this record of additional cases may be of some value.

Park-square, Leeds.

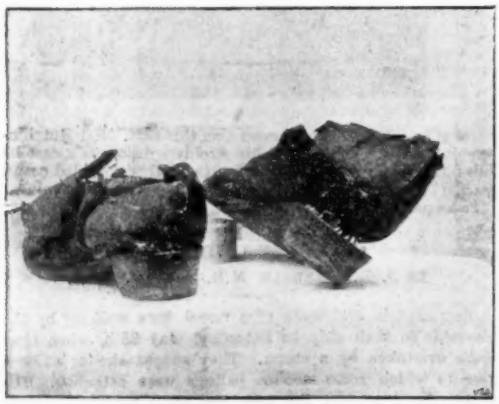
[1] L'Union Médicale, Jan. 17th, 1893.

DEATH BY LIGHTNING.

By J. D. WARDALE, M.B. and B.S. Durh.

THE captain and mate of a vessel were walking by the riverside to their ship on Saturday, May 25th, when they were overtaken by a storm. They sought shelter under a tree to which some wooden palings were attached. The former leant against the tree, the latter reclining against the fence, with his right side against his companion. Whilst in this position they were struck by lightning, the mate being killed and the captain rendered insensible. He remained in this condition, as far as can be made out, for about an hour. On recovering consciousness he tried to stand up several times, but fell at each attempt. Assistance eventually arrived, and he was conveyed to the Bridgwater Infirmary and admitted under the care of Mr. Routh. On admission he was suffering greatly from shock. His beard on the right side of the face and his eyelashes and eyebrows of both sides were singed. On the back of his right shoulder there was a small burn, and running from the axilla to just above the knee, and in one continuous line, there was another burn about two inches and a half wide, but not very deep. There was a small burn also behind the knee, and one about the middle of the calf. On the left side there was a burn the exact counterpart of the one on the right side—that is, from the axilla to the knee. There were no marks of any description on either

feet or arms. Intense pain was felt, which is still present, but it is not now quite so severe, on the back of the left hand and radiating to the fingers, the pain commencing at the seat of an old fracture of a metacarpal bone which the captain had received some two months previously. The next morning (Sunday) on the back of each shoulder a bloodvessel with its minute ramifications was injected a deep scarlet colour. On the following day this had disappeared. When I saw the body of the mate, about eighteen hours after death, it was almost black, the hair was very much singed, and there was no trace of eyebrows; blood and a serous fluid were pouring from both ears. I was told that the body was burnt down the left side. I examined the feet but could find no trace of injury. The outer garments of both men were literally torn into ribbons. The soles of the deceased's boots were thickly studded with nails and iron boot protectors. The uppers



were joined to the soles by nails. The uppers, from the heels to the toes, were torn away from the sole, one side of one boot being missing. The captain's boots had few or no nails in the soles, but thick iron heel-plates. The uppers were torn from the soles at the heels only, and wooden pegs had been used in making the boots instead of nails. On examining the tree a piece of bark, about two feet square and just at the height of a man's shoulder, was torn off.

The Infirmary, Bridgwater.

A CASE OF ABNORMAL AND EXTENSIVE PIGMENTATION IN AN INFANT.

BY W. A. MOYNAN, M.D., Q.U.I. and M.CH.

THE following case, though not of any clinical value, is certainly interesting, if not unique.

In March last I attended the wife of a working class patient during her confinement. The mother's labour was in every respect perfectly normal, but it was otherwise with the child.

FIG. 1.

Photograph untouched.

FIG. 2.

Photograph retouched, to show darkest part of pigmentation.

The latter is the subject of an extraordinary amount of pigmentation of the skin, confined almost entirely to the dorsal region. The pigmentation is of such an extensive character that the infant might be fitly termed "piebald." The discolouration starts from a Λ-shaped focus, commencing about the seventh cervical vertebra and pursues (the focus) a distinct course downwards and outwards on either side, round the inner margins of the scapulæ. This Λ-shaped focus is as dark as the skin of an Ethiopian and resembles in metallic lustre a sheet of over-exposed albuminised paper. The discolouration gradually lessens towards the margins, but the whole surface is thickly sprinkled with dark patches and spots. It extends from about the seventh cervical vertebra to the last lumbar, from above downwards, and laterally to about the centre of the ribs on either side. The photograph from which the engraving was made does not correctly show the dark nucleus I refer to, which, instead of appearing as the darkest part of the pigmentation is the lightest; this is probably due to the metallic lustre and to the light (a top one) in which I took the photograph. The mottled appearance over the sacral region and the nates is due to a considerable amount of dark-brown downy hair, from which the pigmented portion of the back is quite free. In addition to the pigmentation on the infant's back there are two patches of black discoloration on the cranium, about the size of a threepenny-piece, and a still smaller patch on the left knee. The darkened skin is in all places apparently healthy, and, excepting for colour, is in no way suggestive of a mole. The family history is briefly as follows. The father is thirty-seven years of age, the mother thirty-five. They married at the ages of twenty-one and nineteen respectively. There have been nine children of the marriage. The first seven died before attaining the age of nine months. The mother attributes this mortality to the fact that during the first ten years of her married life she worked in a factory. The two living children—one the infant above referred to—are both robust and healthy. Excepting for the delicacy of the first seven children, there has been nothing of an abnormal character recognisable in any of them but the last.

Penarth.

A Mirror
OF
HOSPITAL PRACTICE,
BRITISH AND FOREIGN.

Nulla autem est alia pro certo noscendi via, nisi quamplurimas et morborum et dissectionum historias, tum aliorum tum proprias collectas habere, et inter se comparare.—MORGAGNI *De Sed. et Caus. Morb.*, lib. iv. Procemium.

ST. GEORGE'S HOSPITAL.

A CASE OF RUPTURED GASTRIC ULCER SUCCESSFULLY TREATED BY IMMEDIATE SUTURE.

(Under the care of Mr. WILLIAM H. BENNETT.)

THIS case, in which the operation was performed comparatively early (eight hours and a half after the perforation took place), is an admirable example of the benefit attainable by energetic measures undertaken without delay in ruptured gastric ulcer. The diagnosis was mainly based upon the replacement of the normal liver dulness by tympanitic resonance, the most certain of the early objective signs of perforation of the stomach before distension has become general. The comparatively trivial symptoms preceding the rupture are noteworthy. The absence of hæmatemesis at any time is also interesting, but not sufficiently rare in cases of gastric ulcer to need more than passing comment. It was agreed at the discussion on the subject of the treatment of perforated gastric ulcer at the Royal Medical and Chirurgical Society [1] that sudden rupture of the base of an ulcer of the stomach is more common in those ulcers which are situated on the anterior surface of the organs and towards the cardiac end. Certainly some of the most difficult to manipulate after they had been found were those situated in that part. In one case under the care of Mr. Page,[2] which unfortunately ended fatally, it was with the greatest difficulty that he could suture a perforation through an incision two inches to the left of the middle line of the abdomen, though carried to its fullest extent. "The opening was in the anterior surface, close to the lower curvature, and not more than two and a half or three inches from the cardiac end."

At 11.30 P.M. on April 4th last, Mr. Bennett was called to the hospital to see with Dr. Isambard Owen, under whose care the patient had been admitted, a married woman forty-one years of age, who, whilst walking upstairs at 3 P.M. on the same day, felt a sudden violent pain across the umbilicus, became faint, and fell to the ground. Medical advice was at once obtained, and as soon as was thought safe the patient was sent to St. George's Hospital. At the time of the consultation there was considerable collapse, the pulse was small, the temperature subnormal. The abdomen was slightly distended. Above the level of the umbilicus there were acute pain and tenderness; the normal liver dulness was replaced by tympanitic resonance. Abdominal respiration was restricted, but not entirely absent. There was no general peritonitis. The expression of the face was typically "abdominal." There was neither sickness nor nausea. For two years before admission the patient had been troubled with constant flatulence, much increased by food. There had never been acute pain, sickness, nausea, or hæmatemesis. For a fortnight there had been a little "nagging" pain around the umbilicus, which was greatly intensified at a spot an inch above and rather to the right of the middle line after taking solid food. On the whole, however, she considered that she had been in "fair health" until the "breakdown" on the afternoon of the day of her admission. She came of a phthisical family and had suffered three times from inflammation of the lungs. The signs of perforation of the stomach appearing sufficiently distinct, immediate operation was determined upon. The abdomen was therefore opened by an incision in the middle line extending upwards for about three inches from a point just above the umbilicus. A gush of opaque fluid followed the opening of the peritoneum. The exposed surface of the liver was clothed with recent lymph and the parts about the pyloric region were somewhat matted by fresh adhesions. Careful exploration of the anterior aspect of the stomach having failed to detect any lesion, the abdominal wound was enlarged for another inch, the stomach drawn out and turned upwards. There was then found on the posterior surface, about two and a half inches from the pylorus, a perforation equal in size to a No. 6 catheter (English), surrounded by an area of gristly induration about two inches in diameter which, diminishing at the edges, finally faded away into the surrounding healthy parts. The extreme right margin of this induration nearly touched the pylorus itself. The small perforation was just made water-tight by a suture including the whole thickness of the stomach walls excepting the mucous edge. The peritoneum on each side of the perforation, greatly thickened and stiff, was then brought across by six Lembert sutures, so as to completely cover in the occluded perforation. In effecting this some difficulty occurred. The first stitch, which was fastened off rather quickly, at once cut its way through the stiff and thickened peritoneum; the subsequent stitches were, therefore, tightened very slowly. They all then held quite securely. Another series of sutures to act as stays, to reduct the tension on those already introduced, was placed at each end in the long axis of the stomach, extending well into healthy peritoneum. These sutures at the hepatic end passed on to the pylorus. The parts, having been gently wiped over with a clean soft sponge, were returned into the abdomen; the abdominal wound was brought together with silkworm gut and dressed in the ordinary way. No irrigation was practised and no drainage-tube used.

Remarks by Mr. BENNETT.—The number of cases of ruptured gastric ulcer successfully treated by suture at present recorded is so small that no apology is needed for the publication of the case which represents my whole experience up till now of immediate suture in this disastrous affection. I have, however, had, with Dr. Ewart, a case of subphrenic abscess, the result of gastric perforation from ulcer, which terminated in recovery after abdominal section, which will also be soon, I hope, published in full, as it is, so far as I know, the first instance of recovery, under similar circumstances, recorded in this country. Recovery in the case here narrated was uninterrupted and complete. For four days rectal feeding was employed, plain water being allowed to be taken by the

[1] THE LANCET, March 17th, 1894.
[2] THE LANCET, March 24th, 1894.

mouth *ad libitum* in small quantities at a time. A fortnight after the operation solid food was being taken in the usual way with relish and comfort. The abdominal sutures were removed on the seventh day. On May 23rd the patient left the hospital feeling well and rapidly putting on flesh. There was no pain of any kind; the old symptoms of flatulence had entirely gone and showed no sign of recurrence, although she had been taking the ordinary hospital food for a week. Some difference of opinion appears to exist with regard to the best site for the abdominal wound in these cases. Personally, I have no doubt that the situation chosen in this case is, on the whole, the best, seeing that a large majority of stomach ulcers lie towards the pyloric end of the viscus and are readily accessible from the middle line above the umbilicus. I do not remember having seen any perforation towards the cardiac end which could not have been approached in the same way. On the other hand, in cases of perforation near the pylorus, especially if on the posterior surface, as happened in this case, it would, I think, be impossible to get sufficiently free access to the perforation for its secure closure by stitching through an incision made some distance on the cardiac side of the middle line as sometimes suggested, without making dangerous traction upon the parts. Moreover, it must, I feel sure, become more and more clear to those who have much to do with abdominal surgery, and especially to those who, as surgeons to large general hospitals, have rather extensive opportunities for seeing the results of operations performed elsewhere, sometimes after long periods, that the cicatrix resulting from median abdominal section, especially above the umbilicus, is much firmer and less liable to stretch than that resulting from incision in the linea semilunaris or other parts of the lateral abdominal wall, in spite of any amount of care employed in suturing, whether by simple or complicated methods. Resection of the indurated area with a view to the removal of the whole disease was not considered, as it is a proceeding of doubtful propriety in any circumstances, and was in the present instance entirely negatived by the fact that the indurated part could not have been taken away without contracting the stomach cavity to a dangerous extent.

A point of some interest in these and all other cases in which the stomach is sutured (cases of gastrostomy, for obvious reasons, excepted) is the proper time after the operation for commencing to give food by the mouth. In the case now recorded rectal feeding was continued for four days, a period considerably longer than was really necessary, because the patient rallied so quickly from the collapse and progressed so well that it was deemed right to give the stomach as long a rest as was consistent with her comfort. In all cases in which the collapse is profound, and reaction does not immediately follow upon the operation, the sooner warm fluid nourishment is given the better is the chance of survival; and I do not hesitate myself to give nourishment freely by the mouth *at once* if, as I have said, the exhaustion is great, for there is no doubt whatever that nothing is so rapidly effective in causing reaction in shock or great exhaustion as easily digested (peptonised or zyminised) fluid food taken at a temperature of about the normal body heat. During the continuance of rectal feeding warm water, in small quantities at a time, should always be given *ad libitum* to assuage the invariable thirst and to dilute freely the gastric juice, attempts at the neutralisation of which by the use of drugs should be avoided as harmful.

SOUTH DEVON AND EAST CORNWALL HOSPITAL.

A CASE OF PERFORATING GASTRIC ULCER; OPERATION; FATAL RESULT.

(Under the care of Mr. PAUL SWAIN.)

THE extreme difficulty which is met with in the direct treatment of some cases of perforated gastric ulcer is well shown by the record of this case. The surgeon's duty by no means ends when the presence of the contents of the stomach in the peritoneum is proved. It is necessary to find the opening through which the contents have escaped and, if possible, to close it. Should he be successful in his endeavour to do so, it is still very possible that the patient may not recover; for a prolonged operation, undertaken when a patient is suffering from shock and the early stage of peritonitis, is not unlikely to prove fatal of itself. No surgeon would however, decline to operate because of the possible difficulty of the operation, and we hold it incumbent on the medical attendant to give the patient the chance of life afforded by operation as soon as possible; there is no chance without it. Our knowledge of the condition and necessary treatment has much increased of late; this is owing in a large degree to the recognition of the fact that the record of the experience of every surgeon who operates is important, when the number of cases in which operation is feasible is so small.

On Sunday, June 10th, Mr. Swain was called to the hospital to see a young woman twenty-six years of age. Her history was as follows. For the last eighteen months she had been the subject of indigestion. She had vomited occasionally, but had never brought up any blood. Pain after food was very marked. For the previous fortnight she had been much worse. On the previous Friday she ate a hearty meal of turnip pasty, which seems to have been the last straw. At four o'clock on the Saturday afternoon she was attacked with sudden acute pain, not particularly localised, but more especially referred to the chest. She was seen by a medical man, who gave her morphia and on the next day advised her removal to hospital. Her condition when seen was as follows: her countenance was pale, drawn, and anxious. The pulse was 150, the respiration 32, and the temperature 99·8° F. She was deeply under the influence of morphia.

The abdomen was not very much distended, but was very painful on the slightest pressure. The recti were very tense. On the right side there was fair resonance, but on the left percussion gave a very dull note, extending from the cardiac end of the stomach along the descending colon. There was no particular spot more painful than another. Mr. Swain had no doubt that the patient had a perforated stomach and thought the lesion most likely to be towards the cardiac extremity. At 11.30 A.M. she was placed on the operating table, on a water-bed filled with hot water. Previously she had administered to her an injection per rectum of beef-tea and brandy. A median incision was made from the tip of the ensiform cartilage four inches in length, which was subsequently enlarged down to the umbilicus. Upon opening the peritoneum much gas escaped and a large quantity of sero-purulent, odourless fluid, with many flakes of lymph. The pyloric end of the stomach, which was at once exposed, was much congested, and was covered with patches of recent lymph. No sign of perforation could be found here, so the omentum was turned up and the posterior surface of the organ examined without the lesion being found. Mr. Swain observed during these manipulations that much fluid gushed out from the left side of the abdomen, and as he was quite unable to get a view of the cardiac end of the stomach a transverse incision was made outwards to the edge of the left ribs. This enabled him to get at that end of the stomach and at once to discover the seat of the injury. The opening in the stomach was situated near the cardiac end and rather inclining to the posterior surface. It was about the size of a goose quill and exhibited a punched out appearance. The surrounding tissues were much indurated, the induration extending over a circle about two inches in diameter. The predicament was a serious one. The position was one involving considerable difficulty in closing any wound that might be made by excision. The extensive induration of the parts rendered any attempt at inversion impossible. It was equally impossible to bring that part of the stomach up to the wound and fix it. Mr. Swain accepted excision as the best course with the full conviction that bad was the best. He rapidly excised the indurated tissues surrounding the ulcer without much hæmorrhage, except from one point, which was at once secured with pressure forceps. The resulting wound was much larger than he had expected. There was no doubt that the cause of this was the puckering up of the normal tissue of the stomach, which, when set free from the diseased portion, spread out into an incision nearly six inches in length. He closed this, after washing out from the stomach its very foul contents, as rapidly as possible by Lembert's sutures of No. 0 Chinese twist, using a small, curved Hagedorn's needle and needle-holder. The difficulty in passing the sutures at the cardiac extremity of the incision was very great, owing to the depth of the wound and the fixity of the parts. He was also much impeded at this stage by the overhanging liver and by hæmorrhage, which constantly oozed up from below the liver. The insertion of a sponge to stop this so filled up the confined space in which Mr. Swain had to work that he was obliged to

withdraw it. He finally closed the incision with thirty sutures, finding great difficulty in inverting the pouting mucous coat. The general cavity of the peritoneum was then well washed out with hot boracic lotion. It was in a very foul condition, and special attention was required to the pelvis, particularly in front and behind the uterus, which was felt to be coated with fresh lymph. The wound in the integuments was then closed, a Keith's glass drainage-tube being inserted between the liver and the stomach. The operation lasted nearly two hours and a half, and at the end the patient was much collapsed. An intra-venous injection of a pint of saline solution was administered, which at once restored her pulse. She was seen again at 8 P.M. She was fairly comfortable. Pulse 100; temperature 102°; breathing rapid; surface warm. The drainage-tube was sucked out, about three drachms of sanious fluid being obtained. During the night she became very collapsed; her temperature rose to 104°, and in spite of two more saline injections and repeated rectal injections of beef-tea and brandy she died at midnight.

At the post-mortem examination eighteen hours after death the abdominal cavity was found quite clean, the ascending colon and uterus being covered with flakes of lymph. There was no blood between the stomach and the liver. The stomach was carefully removed. The wound measured exactly six inches in length. When tested with a considerable force of water it was found to be watertight. The piece excised containing the ulcer measured in its largest diameter two inches and three-quarters, and in its shortest one inch. The depth of the ulcer itself was half an inch, and the thickest part of the induration a little over one inch.

Medical Societies.

ROYAL MEDICAL AND CHIRURGICAL SOCIETY.

The Results of the Hyderabad Chloroform Commission.

AN extraordinary meeting of this society was held on Tuesday, July 3rd, at 20, Hanover-square, to receive a communication from Surgeon-Lieutenant-Colonel Lawrie on the Results of the Hyderabad Chloroform Commission. Dr. F. W. PAVY, the Vice-President, was in the chair.

Surgeon-Lieutenant-Colonel LAWRIE said:—

Mr. Vice-President and Gentlemen,—Our method of experimentation on the Hyderabad Commission consisted in giving animals in the first place chloroform in enormous doses, without any particular care to keep the breathing natural and regular, though every change in the respiration was noted on the manometer tracing at the time it occurred. Subsequently we gave chloroform in such a way that the breathing was not interfered with except by narcosis of the respiratory centre, and we discovered the mode of death in uncomplicated chloroform poisoning. Later on it became necessary to confirm and amplify our results by cross-circulation experiments, and we found that whenever we managed to get a cross-circulation established and maintained we obtained uniform results which entirely confirmed the previous experiments. It is true that there is a discrepancy between the results obtained in the cross-circulation experiments performed at Hyderabad and those performed at Cambridge by Drs. Gaskell and Shore. This discrepancy is accounted for by certain facts which are brought out by the Cambridge tracings. I have noticed that in the typical Cambridge tracings—for instance, in the tracing of Experiment No. 6—that the blood-pressure of the feeder was excessively low. It was 50 m.m. at the beginning of the observation and 24 m.m. at the end. It seems to me that an animal with a blood pressure ranging from 50 to 24, and which was evidently in a dying state, could not possibly maintain a cross-circulation with another animal; and that therefore in this experiment, which was intended to demonstrate the effect of chloroform sent to the brain of the fed animal alone, the fed got no chloroform. In the second place, in Experiment No. 9, chloroform administered to the fed direct is said to have stopped its heart, and the animal's respiration then stopped and it died. I put it to the Society whether if the fed had been receiving a supply of pure blood from the feeder its brain ought not to have gone on living, as I shall show you later it did in one of the cross-circulation experiments performed at Hyderabad, where the fed's heart was stopped permanently by chloroform. Keeping these facts in view, the question we have to decide to-night is: Is it right or wrong to take the pulse as a guide to the effect of chloroform? The answer to this question depends entirely upon whether chloroform has any direct action upon the heart or not, and the task I have set myself is to prove to you that it has not, and that if the pulse is really taken as a guide to the effect of the anæsthetic danger and death from indirect cardiac failure must be unavoidable. Before I ask you to examine the tracings, I will only remark that from 1889, when the experiments of the Hyderabad Commission were performed, we have made steady improvements in the method of chloroform administration, which correspond with the gradual completion of the proof that the drug does not affect the heart directly, and we attribute our immunity from deaths solely to our disregard of the heart as a factor in chloroform anæsthesia.

The first tracing to which I desire to draw your attention is one of a cross-circulation experiment in which chloroform was sent to the animal's heart alone for three minutes and twenty-four seconds. It produced no effect of any kind whatever, no lowering of the blood-pressure, no anæsthesia, and no arrest of the respiration or of the action of the heart. This is the invariable result if you can get a cross circulation established and maintained between two animals, and we rely upon it for the final proof that chloroform administered by inhalation has never, under any circumstances, a direct action upon the heart, the Hyderabad Commission having previously established the fact that the direct fall of blood-pressure under chloroform cannot be due to weakening of the heart. The second tracing is one of an experiment which was performed on March 6th, 1890. This tracing shows you what takes place when chloroform is sent to the brain alone, and it is on tracings of this kind, when chloroform is sent to the brain and not to the heart, that we rely for the proof that the fall of the blood-pressure which is produced by the direct action of chloroform is entirely due to vaso-motor narcosis, and is harmless or perhaps beneficial to the heart. The second point about this tracing is that it shows practically everything which invariably takes place in death from uncomplicated poisoning by chloroform. It is a tracing of an experiment in which the animal's breathing was absolutely regular and natural, until it failed and was permanently arrested by narcosis or paralysis of the respiratory centre. It demonstrates that when chloroform is given with regular breathing it produces lowering of the blood pressure with first anæsthesia, then stoppage of the respiration, and then failure of the action of the heart and death. If you consider this tracing you will see that when the respiration showed that the administration was becoming dangerous, and even when it failed and stopped, there was no sign of failure in the pulse, and the animal might easily have been restored by artificial respiration. You will also see that when the pulse showed signs of danger, which was not till several minutes (three) after the respiration had ceased, the animal was practically in a hopeless state and recovery was probably impossible. To put it in another way, you can see from the tracing that the information furnished by the first sign of failure in the pulse amounted to nothing more than an intimation that the breathing had stopped three minutes previously. It is clear, then, that by taking the respiration as a guide the chloroformist would have had early and ample intimation of the approach of danger, and that the animal's life would never have been jeopardised; whereas, it is equally clear that he would have perceived no sign of danger in the pulse until it was, in all likelihood, too late to save the animal's life. Having contrasted the difference in the results of taking the respiration and the pulse as a guide in chloroform administration with regular breathing, we ought next to examine the difference between the two methods when the breathing is irregular. But, practically speaking, this is superfluous because, no matter how chloroform is administered, the information furnished by the pulse—of the reflex stoppages of the heart, for example, which can only occur when the breathing is interfered with—is always second-hand information and shows that something has gone wrong with the breathing which might have been prevented by attention to that function itself. It is sometimes stated by anæsthetists who watch the pulse under chloroform that they have observed cases, clinically, in which the pulse altogether failed, though the breathing previously and at the time was regular and

normal. It is difficult to deal with assertions of this kind which are not supported by notes of the facts recorded at the time they actually occurred. It is sufficient to state, once for all, as regards these cases: (1) that if the pulse is really taken as a guide the administrator's attention is necessarily divided between it and the breathing, and respiratory changes which lead to reflex cardiac arrest and to indirect heart failure may, therefore, be overlooked; and (2) that reliable experiments have proved that reflex stoppage and indirect failure of the heart can never be produced under chloroform, except by interference with the breathing. The third point which this tracing brings out is our oft-repeated contention that chloroform anæsthesia alone, which is all the chloroformist ever wishes to produce, is free from risk. By examining the tracing you will perceive that if chloroform is not pushed beyond the point where anæsthesia is complete the patient or animal never comes within the sphere of danger at all. The perfection of chloroform administration consists in maintaining the blood-pressure and the anæsthesia exactly at the level of the dotted line on the diagram during the whole time the surgeon is operating. The question is, Can this always be done, and is it the fault of the chloroformist if it cannot? In a certain class of cases—as, for instance, in particular operations about the mouth—the inhalation ought not to be pushed as far as this, because the patient, if too thoroughly anæsthetised, may incur risk from choking during the surgeon's manipulations, or from blood finding its way into the air passages. In a second class of patients there is no difficulty either in producing normal anæsthesia with a perfectly regular fall of the blood pressure up to the point where anæsthesia is complete, or in maintaining it afterwards at the level of the dotted line in the diagram. But there is a third class of cases, by far the largest, in which irregularity in the fall of the blood pressure is produced by irregularities of the breathing, while the patient is going over. These irregularities can be minimised by skill on the part of the chloroformist, but they frequently occur in spite of his skill, no matter how skilful he may be. Owing to fright or to the pungency of the chloroform vapour some patients resist, and struggle and breathe irregularly, from the commencement of the inhalation. Others become intoxicated before anæsthesia is complete, and struggle violently and hold their breath, and otherwise breathe irregularly. In others, again, narcosis of the respiratory centre sets in very early in the administration, and what may be called "automatic asphyxia" is produced. What do all these facts amount to? They constitute the strongest possible argument, not in favour of taking the pulse as a guide, but in favour of the most unvarying and undivided attention to the respiration—an attention so undivided and intelligent that, whatever irregularity may occur in the breathing, an irregular intake of the drug is never allowed to take place. When once the chloroformist has taken the patient safely through the first stage up to the point where anæsthesia is complete there ought to be no real difficulty in maintaining the anæsthesia and the blood-pressure at the level of the dotted line in the diagram. It must not be forgotten, however, that no anæsthetist ever meets with two patients who inhale chloroform exactly in the same manner, and that what is an overdose to one individual is a normal or an insufficient dose to another. There is no time to go into this point more deeply, but I think I have shown that, while it is possible by proper attention to the respiration to give chloroform with uniform safety, no man can do so who dreads heart failure and takes the pulse as a guide. In fact, the safety of the patient when the pulse is taken as a guide is proportioned solely to the amount of attention which can be spared for the respiration. The last point which we have to consider is the most interesting of all. It relates to the mode of death in uncomplicated chloroform poisoning. Dr. Ferrier lately called my attention to the important bearing which Mr. Horsley's experiments upon bullet wounds of the head have upon the question of death from chloroform; and Mr. Horsley has given me permission to make use of his observations in any way I please. I shall give you them as far as possible in his own words—which cannot be improved upon. The effect of a bullet entering and traversing the cranial cavity at moderate velocity is to produce "complete arrest of the respiration and a slight fall of the central blood-pressure. A little later (5.10 secs.) than the arrest of respiration a remarkable rise in the blood-pressure occurs, this rise continuing until the normal tension is exceeded. These observations prove beyond doubt that the first cause of death is not what it is usually supposed to be and as taught in the text-books—namely, arrest of the heart and syncope, since, as you see, the heart goes on beating although the respiration has completely stopped. Furthermore, if we quickly perform artificial respiration, we obtain recovery from the otherwise fatal arrest." Mr. Horsley's remarks about the first cause of death in bullet wounds of the brain apply word for word to death from chloroform; but the resemblance between them is much more complete and remarkable than it appears to be at first sight, and we must consider them *seriatim*. 1. In death from chloroform the respiration is arrested; but it is arrested gradually, and not suddenly, as in death from bullet wounds. It is quite possible that in death from chloroform the respiration may occasionally and under certain circumstances be arrested so rapidly as to amount practically to a sudden stoppage; but I have only seen this sudden stoppage of the breathing take place once, and in the case in which it occurred anæsthesia was complete. 2. The second point of resemblance is that in death from chloroform the stoppage of the respiration is followed by gradual failure of the heart; it simply runs down. This is precisely what Mr. Horsley states about death from bullet wounds. 3. In chloroform poisoning the arrested respiration may frequently be restored by artificial respiration, and if death ensues the post-mortem appearances are those of paralysis of the respiratory centre and not of asphyxia. This again is precisely what Mr. Horsley states with regard to death from bullet wounds of the brain. 4. In death from chloroform the respiratory centre is narcotised or paralysed from the commencement, and is never stimulated at first as it is in asphyxia. This remark applies equally to bullet wounds, except that the narcosis of the respiratory centre is gradual in chloroform poisoning, and paralysis of that centre is sudden in bullet wounds of the brain. 5. The proper thing to do in chloroform poisoning is to employ artificial respiration rather than the giving of stimulants. These, again, are Mr. Horsley's own words with regard to bullet wounds of the brain. 6. In chloroform poisoning the narcosis may be complicated by vagus stimulation which produces marked slowing of the heart. The same thing occurs in bullet wounds of the brain; hæmorrhage may be produced which stimulates the vagus centre by pressure on the medulla and causes marked slowing of the heart. In chloroform poisoning we regard this slowing of the heart as a safeguard, in that it tends to diminish the blood supply which is conveying the poison to the brain and producing the fatal narcosis. In bullet wounds of the brain the slowing of the heart may also be a safeguard, in that it tends to arrest the hæmorrhage which is producing the fatal compression. From the year 1879—the fatal year of the Glasgow committee—the opinion has gained ground that death from chloroform is due to primary arrest of the heart and syncope. This belief corresponds closely with the opinion, hitherto, however, held universally, that bullet wounds of the brain cause death by arrest of the heart and syncope. We now know that bullet wound of the brain, no less than chloroform poisoning, causes death by respiratory arrest, and that it is not due either to syncope or to asphyxia. No doubt in death from chloroform the process may be complicated by asphyxia, but it is important to bear in mind that the only danger of asphyxia under chloroform is to cause an increased in-take of the anæsthetic and very rapid narcosis of the respiratory centre, a narcosis which may be so rapid and permanent as to appear very like sudden death. It has been stated that when the respiration stops in chloroform poisoning the heart may stop suddenly. I have frequently seen reflex stoppage of the heart mistaken for heart failure in the laboratory—dogs removed as dead, because the needle in the heart had stopped moving, which afterwards revived spontaneously. I have recorded one case in the operating theatre, where a child was left for dead because no heart sounds could be detected after its respiration had stopped from an over-dose of chloroform. This child, like the dog, revived spontaneously. The only authentic instance I know of in which the heart actually failed within a very short time after cessation of the respiration occurred in a cross-circulation experiment in Hyderabad. Chloroform was administered to the feeder, and the fed's breathing stopped. The chloroform to the feeder was stopped, but the fed's heart very quickly (in a few seconds) ceased to beat. The feeder revived, and so also did the brain and head of the fed. The fed's head then made unavailing movements of respiration, and

in a few minutes it was fully restored to consciousness. We tried to perform artificial respiration, but the fed's head seized a student's finger and bit it viciously. The fed's thorax was then laid open, and its heart was removed from its body. The head went on living afterwards, as an appendage of the feeder, for twenty minutes, as long as the cross-circulation was maintained. This is what ought to have occurred in Drs. Gaskell and Shore's cross-circulation experiment, No. 9, if the fed animal's brain had been properly supplied with pure blood from the feeder at the time its heart stopped—i.e., if the cross-circulation had been established and maintained, which their own tracing shows clearly could not have been the case. In this experiment the fed's heart had been profoundly weakened beforehand by phosphorus poisoning. Allowing that the same stoppage of the heart might occur clinically in patients with very weak hearts, this affords no reason for watching the pulse; but, since the stoppage depends on the stoppage of the respiration, it forms an argument in favour of additional care being taken to maintain natural regular breathing in all cases of this kind.

To sum up our position. We claim that the tracing I have shown you of the experiment of March 6th, 1890, demonstrates the fact that the first cause of death in uncomplicated chloroform poisoning is stoppage of the respiration from narcosis of the respiratory centre, and not arrest of the heart and syncope. Unless it can be proved that our experiments and Mr. Horsley's are unreliable it is clear that the first cause of death from chloroform is on all fours with the first cause of death from bullet wounds of the brain. The discrepancy between the cross-circulation experiments of Drs. Gaskell and Shore performed at Cambridge and those performed at Hyderabad thus ceases to be a matter of any importance, as the proof that chloroform only affects the heart by failure and stoppage of the respiration needs no further confirmation.

Dr. PAVY said, in proceeding to the discussion of this communication to which the Fellows had just listened, he would ask the gentlemen who were going to address them to condense their remarks as much as possible.

Dr. GASKELL said that he would like to point out that Dr. Shore and he had performed a great number of experiments on this subject which had shown conclusively that chloroform given to a fed animal produced a weakening of the heart, resulting finally in its stoppage. In this, he said, they were in accordance with all other observers who have worked on this question except the Hyderabad Commission. It seemed to him that when a mass of evidence was brought forward on one side of a positive nature something stronger is required in the way of evidence than one solitary experiment—for that was all that Surgeon-Lieutenant-Colonel Lawrie had given as proof in the opposite direction, and this is all the more necessary when the experiment is a purely negative one. In scientific working it is known that when a number of results have been obtained in one direction a much larger number of negative results ought to be given to controvert them. He pointed out that the diagram exhibited by Surgeon-Lieutenant-Colonel Lawrie of his and Dr. Shore's results was misleading. He said that this particular experiment was only one of a whole series of experiments, in some of which the blood-pressure of the feeder has been lower than others; but in many other experiments the blood-pressure had been fairly high, and undoubtedly in some a higher blood-pressure had been obtained subsequently. If in cross-circulation experiments blood is not being sent to the brain of the fed animal through the feeder, and if the four brain arteries are ligatured, convulsions would immediately ensue. In opposition to Surgeon-Lieutenant-Colonel Lawrie, he mentioned that the respiration sometimes continued for four minutes or even more than that after the absolute cessation of all heart beats, and he could tell the society that in all cases of cross-circulation experiments, whenever chloroform had been given to the fed, and the heart's beat had been reduced to absolute zero, the respirations have continued for a very considerable though varying length of time. One experiment that Dr. Shore had just performed in Cambridge registered the respirations of the fed for a considerable length of time after the heart had ceased to beat. Referring to this single experiment of Surgeon-Lieutenant-Colonel Lawrie, he said that when the chloroform was given it was only continued for three minutes. If you do not get the chloroform very strong, or if the animal receives it badly, it is the commonest thing in the world to find no great fall of blood-pressure until after three minutes, and it has been found again and again that it is necessary to wait longer than that period to see the heart failing and the animal killed. Finally, Dr. Gaskell considered that the fact—as indicated upon diagrams made by Surgeon-Lieutenant-Colonel Lawrie and published in THE LANCET—that in Surgeon-Lieutenant-Colonel Lawrie's experiments clotting occurred, vitiated those experiments.

Mr. VICTOR HORSLEY said he was very glad to have the opportunity of saying a few words simply from the point of view of danger to life, from the danger of chloroform, and to show four tracings on the screen illustrating what he had to say. He had had a very large experience in administering anæsthetics to animals, and he had also had the misfortune to witness three deaths of human beings from chloroform. He was perfectly persuaded, from his own observation, that in the vast majority of instances death was entirely due to arrest of respiration; indeed, he was perfectly certain of it, and that if the animal were inverted and artificial respiration re-established it would be restored to life. He believed that more experience would settle the matter in dispute between the two observers. (Mr. Horsley indicated on the screen some tracings to show the rise of blood-pressure, both central and peripheral, when animals were shot through the cerebral hemispheres.)

Professor LOUGHTON considered with Surgeon-Lieutenant-Colonel Lawrie that the failure of the respiration was a fertile source of death, and felt that the first thing to do would be to set up artificial respiration and inversion of the patient.

Dr. SHORE criticised strongly the remarks made by Surgeon-Lieutenant-Colonel Lawrie on the cross-circulation experiments. He said that they had waited long for the tracings which Surgeon-Lieutenant-Colonel Lawrie had obtained in Hyderabad. Six months had elapsed, and Surgeon-Lieutenant-Colonel Lawrie's results had been embodied in three tracings which appeared in certain numbers of THE LANCET. Surgeon-Lieutenant-Colonel Lawrie stated in one number of THE LANCET that he performed cross-circulation experiments almost daily during a period of several months, so that he should at least have been able to bring with him some twenty or thirty tracings. He (the speaker) regretted that Surgeon-Lieutenant-Colonel Lawrie had not been able to publish his results in the same way as those of the Hyderabad Commission were published three years ago, when experiments on 700 animals were recorded. This he looked upon as one of the most valuable pieces of work which had ever been done on this question, and it was valuable because the results were there written by the animals themselves on the smoked paper. It was the tracings which he wanted to look at. Those shown now afforded no evidence in support of Surgeon-Lieutenant-Colonel Lawrie's great proposition that chloroform has no direct action on the heart. They did not want Surgeon-Lieutenant-Colonel Lawrie to read the tracings. They would read Surgeon-Lieutenant-Colonel Lawrie's tracings for him if they had them. He then criticised at length and from the same point of view as Dr. Gaskell the diagrams exhibited by Surgeon-Lieutenant-Colonel Lawrie. He concluded by saying that it had been insisted by Dr. Gaskell that when a great proposition such as this is put forth—namely, that chloroform has no direct action on the heart, some proof, and not merely assertion, is required. The tracings put forward to explain the physiological points should be presented. Though they were perfectly willing to listen to, and very glad to have the views of, Surgeon-Lieutenant-Colonel Lawrie, they wanted some proof. It did not matter who might bring forward a scientific proposition, whether a Hunter or a Harvey, it could not be accepted without proof.

Dr. LAUDER BRUNTON said: The question before us to-night is one of immense importance; almost every being living in this world is interested either directly or indirectly in it; and it seems to me of the very utmost importance that we should not lose sight of the main points in endeavouring to settle minor points. The main point before us to-night is really the safety of chloroform and the means of insuring that we shall be able to administer it to our patients without death. Whatever our opinions may be in regard to the questions that Surgeon-Lieutenant-Colonel Lawrie has brought forward, I think we must be perfectly at one in thinking that he has done immense service to the investigation of the question which he has taken up; that he has brought together a batch of evidence greater than has ever been brought forward before to settle the question whether chloroform acts upon the heart or not. But in

talking of the action of chloroform on the heart we must remember that it is not a question whether chloroform acts in or on the heart, or can act upon the heart, but whether it does act upon the heart when administered by inhalation. It was very clearly expressed by the Hyderabad Commission that chloroform has the power of acting as a protoplasmic poison. Chloroform will destroy every living thing if brought in contact with it in sufficient quantity; it will completely paralyse the respiration and it will destroy the heart; it will render a piece of muscle as rigid as a board, and the effect of chloroform, acting upon the heart in such a way, is utterly to destroy its vitality if brought into contact with it in sufficient quantity. The question before us was whether it could be brought into the heart in sufficient quantity to destroy its vitality when given as an anæsthetic through the respiration. Our contention was that when given by inhalation it always paralysed the respiratory centres, and this stopped before a sufficient quantity was taken into the body to paralyse the heart. Now Dr. Gaskell has very rightly insisted upon the necessity for evidence. But we have in regard to the action of chloroform an immense body of evidence. On looking over some old numbers of THE LANCET I have found, for instance, that in 1848 Mr. Wakley, one of the present Editors of THE LANCET, brought forward no less than 100 experiments showing that chloroform killed by paralysing the respiration and not by paralysing the heart. Since that time an immense number of other experiments have been made, and the conclusion to which they have all led is the same—namely, that when chloroform is given by inhalation it kills after stopping the respiration, and that the heart goes on after the respiration has ceased. This we know is precisely what occurs when an animal is asphyxiated, and however the animal may be if you arrest the respiration the heart is bound to stop a certain length of time afterwards, because it is poisoned by the venous blood. Now in regard to the question brought before us to-night, the action of chloroform upon blood-pressure, it seems to me that this is a question of completely minor importance. We do not say that alcohol is a dreadful poison, and that it is risky to administer alcohol because it paralyses and depresses the heart; yet alcohol has precisely the same action on the blood-pressure as chloroform, but in a less degree. Put the heart in alcohol and it will stop beating; inject a quantity of alcohol into the jugular vein of the animal and the animal will die. Give alcohol in sufficient quantity not to kill the animal but simply to narcotise it thoroughly, and you will get a fall of blood-pressure almost precisely similar to that which is produced by chloroform. We have got before us the results of honest men, in each case done thoroughly and conscientiously, yet apparently entirely antagonistic. It seems to me that we ought to look at them as facts seen from different points of view, and to inquire why it is that they do not agree. One point that Dr. Gaskell and Dr. Shore have laid a great deal of stress upon is that they got no clot. Now how is it that they got no clot? It was because they injected into the veins of the animal a quantity of peptones. Now we know that peptones are powerful poisons. They destroy the coagulability of the blood. What else they do we do not know, but that is one factor in their action, and it seems to me highly probable that there are others as well. Surgeon-Lieutenant-Colonel Lawrie noted that in one case the heart stopped very rapidly, and why? Because the heart had been previously weakened by phosphorus. Now, at Hyderabad we foresaw perfectly that it would be necessary to discriminate between two classes of cases—deaths from chloroform due to the action of chloroform *per se*, and deaths *during* chloroform due to the effects of the operation, to asphyxia, or to poisoning of the heart either by venous blood or by substances circulating in the blood. We have in the experiments of Dr. Gaskell and Dr. Shore, I think, one example of partial poisoning and death during chloroform from the circulation of substances in the blood which were not normally present there; and I think that the question has been put before us very fairly so far as we have the data to go upon. Surgeon-Lieutenant-Colonel Lawrie shows that along with the immense amount of data obtained by him, Wakley, McWilliam, Snow, and others, the first sign of the toxic action of chloroform is failure of the respiration, and if we fail to watch the respiration and wait for the failure of the heart we are in the same condition as the driver of the express engine, who, disregarding the distance signal, which would have allowed him time to avoid the danger, does not stop until he gets close up to the danger signal. There is no objection to watching the pulse if you can do so without damaging the respiration, but the first thing to be done is to keep a careful watch upon the respiration. It has occurred to me in looking over the statistics that there has been a marked increase of deaths through chloroform in later years, and this has suggested to me, in connexion with the fact that the most troublesome cases generally occur among strong, healthy men in the full vigour of life, that possibly there was some new factor in later years which had rendered deaths from chloroform more frequent. I could not find any other except the increase in the foreign meat trade, which has altered the feeding of the population to an extent scarcely credible within the last twenty years. Whether this be so or not, I think that the conclusion that one cannot help drawing, not merely from Surgeon-Lieutenant-Colonel Lawrie's evidence but from the evidence of a whole number of experimenters from the time of the introduction of chloroform until now, is that it paralyses the respiratory centre before it paralyses the heart, and the first thing to do in order to avoid danger is to look at the respiratory centre and watch the slightest change in it as the first sign of danger to the patient."

Dr. GASKELL here pointed out that the peptones given by himself and Dr. Shore to prevent blood-clotting were given by Surgeon-Lieutenant-Colonel Lawrie also.

Mr. BAILEY could not see why the ordinary chloroformist could not attend to three things, which he considered necessary: the condition of the pupil, the state of the respiration, and the state of the pulse.

Dr. DUDLEY BUXTON, after referring to the value of the work of the Hyderabad Commission and the generosity of the Nizam, thought that it was a question of very little importance to patients whether they were to be killed by the heart or by the respiration, and that the important issue was whether, as practical men, a way could be found of giving choloroform safely, and what to look upon as the safest guides. He had been immensely struck by the arguments and methods of those who took up the position that to watch the respiration was the safest method to adopt. He was not really retracting what he had written on the subject, but was speaking from further experience, having seen the way in which the respiration should be watched. The respiration, as it is watched by those who really point to it, is watched as closely as a cat watches a mouse. There must be one immense struggle of attention to study the least variation in the rhythm of the respiration during the whole time of administration. He must demur to what Surgeon-Lieutenant-Colonel Lawrie would teach in one way, and point out that even in obtaining anæsthesia by chloroform we are, to a certain extent, narcotising the respiratory centre in the medulla oblongata. In this way a stage of incipient paralysis is arrived at. Dr. Buxton concluded by attributing a very large proportion of deaths under chloroform to carelessness.

Dr. DAVID NEWMAN considered that the Glasgow experiments showed that death did not occur in the way that the Hyderabad Commission indicated, but that it occurred only as a consequence of interference of the respiration through the nervous system. The only condition which is not preventable by which respiration can be arrested is the one by which it is attacked through the nervous system. Any practical surgeon knows quite well that the respiratory centre is more easily inhibited than the cardiac centre. The Glasgow report admitted that, and confessed that the respiration was more likely to come into abeyance than the heart; but there were certain cases where there might be a sudden arrest of cardiac action. He had studied the subject both in the laboratory and in the operating theatre, and, in his opinion, the periods of danger were at the beginning and at the end of the administration of chloroform. Patients at these times were more likely to suffer from shock, and this might lead to sudden inhibition of the heart similar to that produced by stimulation of the vagus centre. And this is the point at issue between Surgeon-Lieutenant-Colonel Lawrie and the Glasgow Commission. The latter observers say that the sudden depression is due to vagus action; Surgeon-Lieutenant-Colonel Lawrie and the Hyderabad Commission say that it is pulmonary. The changes that take place through the lungs during anæsthesia can only be studied in the very lowest animals. About fourteen years ago he (Dr. Newman) conducted some experiments upon the frog and watched the changes produced on the circulation. The circulation of blood is not dependent entirely upon the action of the heart; the lungs perform a very important function during inspiration. Not only do we inspire air, but we also

inspire blood through the vessels; so if respiration ceases there is this most important factor to consider.

Dr. HEWITT thought that everyone familiar with chloroform was able to draw a distinction between a deep and a light chloroform anæsthesia. The observation of the respiration alone and the neglect of the pulse would, in his opinion, lead to difficulty. He would point out that the Royal Medical and Chirurgical Society had defined the circumstances under which chloroform may be given and the indications which should be observed, and their committee had actually stated that the pulse should be observed during its administration. Anyone who came and stated exactly the opposite view must be received in a very serious manner, and it was for the society to vindicate the previous finding which it had published before the world and which they had hitherto upheld. No amount of physiological reasoning would make him swerve in one iota from the clinical facts he had observed—namely, that at a particular juncture it was found that respiration could proceed without any pulse going on at the wrist.

Dr. SILK said that the conclusions of the Hyderabad Chloroform Commission had been opposed diametrically from every point of the compass, and he could not attempt to decide between the academic discussion as to the reading of the tracings; but he could not help being very much impressed indeed by the stupendous amount of trouble taken by the physiological observers.

Dr. SHAND gave some account of his early experience of the administration of chloroform in connexion with the wounded on the battle field.

In his reply Surgeon-Lieutenant-Colonel LAWRIE traversed the criticisms of Drs. Gaskell and Shore and explained that he had not been able, on account of the expense, to bring all the tracings with him to this country which he had obtained. His Indian experience extended to twenty-two years, and he had given chloroform regularly for seven years in this country, and he assured the society that he had never noticed the slightest difference between the natives of India and the natives of Europe regarding their susceptibility to chloroform.

At the conclusion of the discussion the society passed a vote of thanks to his Highness the Nizam of Hyderabad for his munificence in providing funds for the carrying out of investigations on the action of chloroform.

CAMBRIDGE MEDICAL SOCIETY.

Arthrectomy of the Ankle-joint.—Erythema Nodosum.—Plasmodia of Malarial Fever.—Discussion on Abnormalitis of Muscular Action.

A MEETING of this society was held on Friday, June 1st, Mr. HYDE HILLS, President, being in the chair.

Mr. COPLEY showed a case of Arthrectomy of the Ankle-joint, the operation having furnished a good result.—Mr. GIFFORD NASH showed four cases of Erythema Nodosum occurring in one family within ten months. On March 17th, 1894, he saw a general servant aged sixteen suffering from a well-marked attack of erythema nodosum affecting the legs. He sent the girl into the Bedford Infirmary, and whilst there the eruption also appeared on the forearms. Her mother informed him that three other of her children had recently had the same affection, and on inquiring from Mr. Banks of Risely whether this was so he informed him that he had attended three of the children with well-marked attacks of erythema nodosum. In this family there were seven children, six of whom lived at home. The first affected was a boy aged nine, who was ill in June, 1893, in September a girl aged eighteen was affected, in February, 1894, a boy aged fourteen, and in March his patient, the girl of sixteen. In each case the rash appeared on the forearms and legs. Neither the father nor mother had been affected, but thirteen years ago one of the father's sisters had the same affection when she was living in the same village. The interest of these cases lay in the relationship of these children and in the occurrence of four cases of this comparatively rare disease in such a short space of time. None of the special works on skin diseases or on general medicine to which he had referred mentioned any family predisposition to this disease, beyond that implied by saying it occurred in rheumatic persons. Dr. Pye-Smith, to whom he related these cases, had only once seen two cases in one family, and described these cases as remarkable. It was also of interest that two of the patients were males.

Dr. LAURENCE HUMPHRY gave an account of some observations on the Plasmodia of Malarial Fever he had lately been making. The patient, a soldier aged twenty-four, had just returned from India, where he had malarial fever in 1889, and since then he had had several slighter attacks. On March 1st, 1894, he returned to England and had an attack of fever at Royston. He was admitted into Addenbrooke's Hospital on May 19th, and he had two well-marked attacks of chills, fever, and sweats a few days after admission. The type of fever was somewhat irregular, but appeared to be tertian. After quinine had been given in moderate doses he ceased to have any more fever, so that there were only two opportunities of examining the blood. Specimens of blood were taken before, during, and after the attacks, and in some of those taken during the interval Dr. Humphry had been able to find the amæboid bodies inside the red discs described by Laveran, Golgi, and others, and supposed to be one form of organism peculiar to malarial fever and of which there were in all probability several forms or stages. In one specimen there appeared to be signs of segmentation. The opportunity for examination of the blood was cut short by the recovery of the patient before Dr. Humphry had had sufficient time to acquire a good method of examining and fixing the specimens. Dr. Humphry referred to the observations of Laveran, Golgi, Osler, and others.

A short discussion on Abnormalities of Muscular Action was introduced by Mr. HEMMING on a paper read by Sir George Humphry at a previous meeting.

CATHOLIC UNIVERSITY MEDICAL SCHOOL (DUBLIN) MEDICAL AND SCIENTIFIC SOCIETY.

Exhibition of Cases.—Operation for the Cure of Hydrocele.

A MEETING of this society was held on June 4th, Dr. ROCHE being in the chair. Mr. O'DUFFY showed an Obturator, with Masticatory Apparatus for Fissure of Palate; the patient spoke clearly while using the apparatus, but was almost incomprehensible without it.—Mr. FAGAN exhibited a specimen showing both layers of the Tunica Vaginalis.—Dr. BIRMINGHAM showed Abnormal Kidneys and Ureters, including Single Kidney, Horse-shoe Kidney, and Sigmoid Kidney.—Dr. ROCHE referred to the importance of these abnormalities, owing to the frequency of surgical operations on the kidney; on this account the abdominal nephrectomy was preferable to the lumbar, as the condition of both kidneys could be noted in the former.—Dr. O'SULLIVAN asked if any abnormalities of the sexual organs had been noted, as this was usually the case.—Dr. BIRMINGHAM replied in the negative.—Mr. MCARDLE gave a demonstration of the method of using Mr. O'Dwyer's New Laryngeal Intubation Apparatus.—Dr. BLAYNEY read a paper on Pernicious Anæmia. He referred to the question of the nature of the blood, whether it is but an internal medium for the other tissues, or itself a living tissue peculiar only in having a liquid matrix. The histology of normal blood having been gone into, a short account of the processes of hæmogenesis and hæmolysis was given. The changes which occur in the blood and different organs in pernicious anæmia were then dealt with, and the paper concluded with a brief account of the views held with regard to the pathology of the disease, Hunter's theory of a micro-organismal origin being brought forward and acquiesced in.—Dr. ROCHE said he considered it very probable that the disease was of a nervous origin, as the disease is often caused by shock. It is subject to frequent remissions and relapses, occurs in members of the same family, and is benefited by arsenic, a noted nervine tonic.—Dr. COFFEY referred to the general tendency to regard the blood from a mechanical point of view; it is just as much a tissue as bone, with its own matrix and characteristic cells.

Mr. GORMAN LALOR read a paper on a New Operation for the Radical Cure of Hydrocele. The history of a case was given in illustration of the method practised by Mr. McArdle. The patient, aged twenty, was admitted to St. Vincent's Hospital suffering from a vaginal hydrocele. An incision was made over the swelling for a space of two inches and a

half through the skin and superficial fascia, catch forceps were applied to the scrotal veins on either side, and the incision continued down to the tunica vaginalis, bleeding points being secured by catch forceps. The fibrous layer of the tunica vaginalis was incised between forceps, and the serous layer separated from it by the handle of a scalpel. The parietal portion was carefully dissected away, and, the globus major being avoided, the forceps holding the edges of the incision, the tunica vaginalis was raised and approximated, and a purse-string suture passed around the incision and tied, the other layers of the fascia being similarly treated. The skin incision was then closed by an interrupted silk suture, the parts washed in carbolic lotion, and a Volkman's dressing applied. The advantages claimed for this operation are: first, the absence of hæmorrhage; secondly, the cellular spaces of the scrotum are not opened, and there is no œdema of the scrotal veins.

Reviews and Notices of Books.

A Dictionary of Medicine, including General Pathology, General Therapeutics, Hygiene, and the Diseases of Women and Children. By Various Writers. Edited by RICHARD QUAIN, Bart., M.D. Lond., LL.D. Edin., F.R.S.; assisted by FREDERICK THOMAS ROBERTS, M.D. Lond., B.Sc., and J. MITCHELL BRUCE, M.A. Aberd., M.D. Lond. New Edition, revised throughout and enlarged. In two volumes. London: Longmans, Green & Co. 1894.

IN announcing recently the appearance of this work, representative of all that is best in British medicine, we cited from the preface which the editor contributes to the volume the gratifying fact of the unprecedented success attained by its first issue. Such a success more than justifies Sir Richard Quain in his original conception of the need and utility of a work of this class, and is, moreover, a testimony to the intrinsic merits of the book itself. The enterprise of one of our leading publishing firms and the arduous labours of Sir Richard Quain and his editorial colleagues have been, indeed, rewarded in the most gratifying manner by this striking evidence of a world-wide appreciation. It would seem as if the compliment so often paid to technical writings, that they are indispensable to every member of the profession, had been quite borne out in this instance. Yet, excellent as the original volumes were, it is impossible not to perceive, as we turn over the pages of this new edition, that the work has been extended and improved in all directions, besides having incorporated in it many a topic that has arisen within the brief period of twelve years since the first edition appeared, showing clearly how fast is the progress and how ardent the pursuit of knowledge in the medical sciences. We believe that this new edition will be deemed by all practitioners as "indispensable" as was the first; and they will find it of especial value in keeping them abreast with scientific research and the practical outcome of it.

In the preface Sir Richard Quain makes a feeling allusion to those of his staff who have gone to their rest since the first inception of the work. Such losses are inevitable in any coöperative undertaking; but they remind us forcibly of the ever-true, if trite, saying, "Ars longa, vita brevis." A work which numbers amongst its contributors names of men so widely honoured and esteemed as Murchison, Parkes, Risdon Bennett, Tilbury Fox, and Marcus Beck cannot but fail to have a perennial interest. Their places have been filled by others, so that literally the dictionary exemplifies that handing on of the torch of knowledge which is one of the finest and truest similes of human progress. Nor has the editor been content to merely fill the gaps that death created. The lengthy list of contributors whose names appear in this new edition for the first time evidences the fact of that progress of science alluded to in the preface. A review can hardly hope to do justice to so vast an undertaking—indeed, no single mind is capable of estimating the value of each and every item in these volumes; it may, however, serve some useful purpose if a brief reference be made to some of the articles which deal with new matter or which are now presented in revised and expanded form.

The subject of Acromegaly is succinctly dealt with by Mr. Godlee, one of the first, we believe, in this country to draw attention to this remarkable malady. In this connexion, as with other allied diseases leading to marked deformities, it would have added to the utility of the description if a woodcut had been inserted. We hasten to add, however, that the dictionary is very well illustrated on the whole. Professor Greenfield writes on Actinomycosis, in which the nature of the fungus and the chronic inflammatory processes to which it gives rise are admirably described. The subjects of Albumoses and Albumosuria are assigned to the competent hands of Dr. Sidney Martin. He points out that the clinical significance of albumosuria or peptonuria, the tests for which are amply detailed according to present knowledge, "is an extensive cell (and proteid) disintegration in the body, in many cases indicating pus formation." A valuable account of Alkaloids is contributed by Professor McKendrick. Dr. F. W. Mott writes upon Pernicious Anæmia, his article containing an interesting comparative analysis of the quantity of iron in the anæmic liver, kidney, and spleen as contrasted with that in the normal liver. The analysis is by Mr. S. A. Vasey and shows that the anæmic liver contained 0·29 per cent. of free iron (ferric oxide), the other organs only presenting traces of this substance. Dr. Allchin, to whom have been allotted many of the subjects connected with medical microscopy, writes an article upon Casts, which he groups in a scientific manner under the heads of "casts of gland-tubules" and "casts of hollow viscera and passages." Professor Schäfer's lucid description of the Cell demonstrates the vast expansion given to our knowledge of these ultimate living elements by the research of recent years; but we agree with him that the subject is one which eminently needs the aid of pictorial illustration. The article on Croup is written by Dr. Maguire, who also contributes that on Diphtheria. The changeful attitude of opinion respecting the nature of croup is exemplified in the definition given by Dr. Maguire. He terms it "an acute febrile affection occurring in childhood, accompanied by inflammatory swelling of the mucous membrane of the larynx, and in some rare cases by the formation of a fibrinous false membrane." Now, to some extent this is a reversion to the opinions formerly held as to the substantive independence of croup; but in reading the article it will be seen that the term "croup" is mainly used in its clinical application, and that if primary laryngeal diphtheria be excluded very few cases of true membranous croup remain for consideration. This being so, we may venture to question the wisdom of retaining the term "croup" at all, since laryngismus, laryngitis, simple and membranous, may more accurately convey the nature of the affection. Dr. Radcliffe Crocker enumerates a long catalogue of "drug eruptions" in the article devoted to that subject; and Mr. Bland Sutton succeeds to the late Dr. Cobbold in the article on Entozoa, which he has revised with skill. The article on Epilepsy bears the name of the late Dr. Brown-Séquard; and that on Epidemics, contributed by the late Mr. Netten Radcliffe, has been revised by Mr. Shirley Murphy. We are glad to welcome a new writer, Mr. John Harold, in the excellent description he gives of the meaning and mode of production of Euthanasia. The new knowledge gained, largely by his own works, upon the Filaria Sanguinis Hominis is incorporated in the article on this subject by Dr. Patrick Manson; whilst in the description of Hæmophilia Dr. Wright enters very fully into recent observations upon the condition of blood in this affection. Dr. Sidney Martin writes upon Immunity, the subject, of all

others, which is engaging the attention of present day pathologists. He succinctly sums up as follows: "The question of immunity is closely connected with that of the cure of disease. In the present state of knowledge but little, except of a theoretical kind, can be said on this point. Immunity is the prevention of the growth of a virus after it has been introduced; cure is the prevention of its further growth after its development has commenced and the symptoms of disease have already appeared." The article on Influenza, contributed by the late Dr. Peacock, is supplemented by a description of the recent pandemic and the experiences gained from it; whilst that on Jaundice, by the late Dr. Murchison, has been revised by Dr. S. Mackenzie.

In the Second Volume the article on Micro-organisms cannot fail to attract attention. It has been written by Professor Greenfield in conjunction with Dr. Robert Muir, whilst the excellent illustrations are nearly all of them drawn from specimens prepared in Professor Greenfield's laboratory. Dr. J. J. Pringle writes upon Mycosis Fungoides—an affection which does not appear to be so rare as was once supposed. He refers to the recent discovery by Stelwagon and Hatch of micrococci in the growths and surrounding capillaries as affording a possible solution to the vexed question of the etiology of the condition. Dr. Ord, in again writing upon Myxœdema, is enabled to record substantial advances both in respect to the pathology and treatment of an affection which he was one of the first to bring to light. Dr. Manson writes upon Negro Lethargy, that curious disorder revealed to us by African explorers. We are pleased to observe in his instructive article upon Pain that Dr. Buzzard refers to the recent contribution of Dr. Head upon the localisation of pain from visceral diseases—a most interesting and suggestive clinical study. Periodicity in Disease, by the late Mr. Netten Radcliffe and Mr. Shirley Murphy, demonstrates the advantage derived from epidemiological study, whilst at the same time showing that the old idea of epidemic constitution cannot be entirely discarded. The charts which illustrate this article speak for themselves, and now that notification is becoming the rule the material for the study of this subject is year by year accumulating, so that deductions will be in time based on firm foundations. Phagocytosis is described by Dr. Sidney Martin, who has had the advantage of the aid of Professor Metchnikoff in the description of the former. The article by Mr. Treves on Physical Education is sensible and all too brief. Dr. Douglas Powell writes upon Physical Examination; and the subject of Plague, in which interest is at present re-awakened, cannot be better studied than in the article here given by Dr. J. F. Payne. Mr. Bland Sutton describes Psorospermosis—a subject which, from its bearings upon new growths, has of late received attention. Dr. McMunn contributes the article on the Spectroscope in Medicine, another instance of the care which the editor has taken to secure contributors of special knowledge on the departments of the subjects allotted to them. But it is not possible to mention a tithe of the articles deserving of notice. It would be too much to say that there are not any which could not have been better produced or more in accordance with present-day teaching; yet it is not saying too much to assert that there are very few which could be so condemned. The labours entailed upon the editors of such a work must be extreme, and each of them has himself made numerous contributions to the text.

Finally, a work which contains contributions on Hygiene and Sanitation by Sir G. Buchanan, Dr. Parkes, Mr. Netton Radcliffe, and Dr. Thorne Thorne; on Diseases of the Nervous System, by Drs. Bastian, Gowers, Ferrier, and Buzzard; on Respiratory Diseases, by Drs. Powell, Green, Williams, and Allbutt; on Diseases of Organs of Digestion by Drs. Fenwick, Roberts, and Allchin; on Renal Disease, by Professor Grainger Stewart, Sir W. Roberts, and Dr. Brunton; on Surgical Affections, by Messrs. Beck, Durham, and Treves; on Diseases of the Eye, by Messrs. Streatfield and Tweedy—to make only a limited selection—cannot but be of a high class, nor can it fail to represent to the best and fullest extent the position now assumed by medical science. Indeed, whether we regard the attainments of the writers, the scope of their articles, or the marvellously complete collection of subjects, there can be no hesitation in regarding the Dictionary of Medicine as a work of standard excellence, not unworthy to rank with the encyclopædic undertakings which have been produced in France and Germany.

Diseases of the Skin: an Outline of the Principles and Practice of Dermatology. By MALCOLM MORRIS. London: Cassell and Co. 1894.

GERMANY, France, England, and Austria have each representative works of the larger size which cover well the field of dermatology, as set forth by Kaposi, the same author's French annotated translation by Besnier and Doyon, Brocq, Duhring, Crocker, Jamieson, and McCall Anderson; but for those who like to take their dermatology in smaller doses the numerous efforts on their behalf—in England, at all events—have not, with the exception of Liveing's useful and comprehensive little book, been quite satisfactory. Mr. Morris, therefore, has a fair field for his attempt. It forms one of Cassell's useful series of medical manuals; it is not, therefore, another edition of his first book, but an entirely new work, which must be regarded as the fruit of his riper experience as a teacher and a dermatologist.

The work commences with three general chapters on the pathology, classification, and principles of diagnosis. The classification of skin diseases on a consistent and scientific basis is admittedly impossible with our present knowledge. The author has elected to follow mainly the arrangement of Unna. Of this classification we would merely remark that to us it is at least as unsatisfactory as the older methods, and requires in its nerve-origin group a plentiful supply of supposition. Moreover, the same disease may sometimes claim a place in more than one group. In the more practical part of the work the author shows to most advantage. Within the limits imposed upon him by this series of manuals he gives a clear and readable account of the various diseases.

In the chapter on Eczema the author makes a praiseworthy attempt to limit the term within more defined boundaries than is usually done, and would exclude all forms of dermatitis excited by local irritants, however much they may resemble eczema produced in other ways, and he therefore defines it as "a catarrhal inflammation of the skin originating without visible external irritation, and characterised in some stage of its evolution by serous exudation." In dermatitis produced by external irritants, he says the lesions are distributed over what may be called the area of exposure; the artificial eczema runs a definite course; and if the action of the irritant is stopped the eruption, as a rule, at once begins to subside. Unfortunately in practice a very large number of exceptions to this general rule is found.

It is interesting to note how the pendulum has swung completely back, as far as the author is concerned, as to the relation of gout to eczema. The etiological connexion has undoubtedly been enormously exaggerated, so that with the laity and many practitioners eczema and gout are almost interchangeable terms, but Mr. Morris, speaking of dyspepsia and gout with regard to their supposed causal relation to eczema, says that to him "they appear to be nothing more than accidental complications." Mr. Morris considers that Wilson's Lichen planus and Hebra's Lichen ruber are the same disease, and therefore designates the affection "lichen ruber planus." The subject has been a

highly controversial one of late years, but few writers are likely to adopt this view of the question.

While it is easy thus to differ with the author in many respects, the work is, on the whole, one of the best smaller manuals on diseases of the skin which has appeared of late years, and the student will get from it reliable, and, for him, sufficient information on the subject of which it treats.

The publishers of this series always do their part well; the general get up of the book is good, and, in addition to seventeen woodcuts, there are eight coloured plates in Mr. Burgess's rather florid style, which add considerably to the appearance of the work, but for some of them the label is a very necessary adjunct.

The Law of District and Parish Councils. By JOHN LITHIBY, LL.B. Lond., Barrister-at-Law. London: Effingham Wilson.

THIS book is the latest and, in many respects, the best of the recent publications on the Local Government Act, 1894. It consists of an introduction, which is a readable synopsis and not a mere paraphrase of the Act; of the statute itself, annotated with discretion; and of an appendix which contains in alphabetical order those sections of the numerous Acts incorporated by reference with the principal Act, together with the Local Government circulars issued under it. The index to the whole is full and reliable. There is little in the Act referring to medical officers of health. A parish council constituted by the Act has the same powers of making a complaint or representation as to unhealthy dwellings as are given to four or more householders by the Houses of the Working Classes Act, 1890, Sec. 31, and upon such a representation being made to him the medical officer of health of the district must inspect the building and transmit the complaint and his opinion on it to the local sanitary authority. Parish councils have also the power to utilise any well, spring, or stream within their parish, and provide facilities for supplying water therefrom, and to deal with any drainage, filth, or stagnant water, by draining or cleansing, or otherwise preventing it from being prejudicial to health, but in all cases subject to the rights of other persons. The editor points out in his notes on this section (8) that the effect is to reserve the exclusive rights of any water company to supply water in the parish, and that no power exists to enter private property to abate any nuisance, so that the powers thus conferred appear to be capable of very limited application. The Act leaves the powers and duties of local sanitary authorities under their new name of district councils very much as they existed prior to it. The parish council may make complaint to the county council of any neglect by the district council to provide adequate sewerage or water-supply, and the county council may thereupon transfer to themselves the powers of the district council in that respect, and appoint a person to carry out the necessary work. A careful reading of the introduction to this book will enable anyone to acquire an adequate knowledge of the complex provisions of this new code of the laws of everyday life. In fact, the volume is so compiled as to make it serve the very objects for which a work of this character is wanted both by officials and by those members of the public who are interested in matters of local administration.

Headache and other Morbid Cephalic Sensations. By HARRY CAMPBELL, M.D., B.S. Lond. London: H. K. Lewis. 1894.

WE have nothing but praise for the diligence with which the author of this volume has sought, by wide reading and careful research, to make his book an exhaustive study of morbid cephalic sensations. It may just be mentioned that his printed list of quoted authorities takes up no less than four double-column pages, and of these many are quoted repeatedly. The book is divided into four parts. The first is preliminary and deals with the anatomical position of pain in headache; the second treats of the causation, under various headings, which may be summarised as peripheral sources of irritation, blood states, and constitutional conditions; the third is concerned with symptomatology; and the fourth with treatment. Every part, nay every page, bristles with the quoted views of observers of nearly every age and of most climes, and this characteristic of the book gives to it a discursiveness at first pleasant, but which tends to become wearisome. And this is really what the book is—a compendium of the views of observers who have studied headache, with some confirmatory or contradictory observations of the author which seem to give a certain amount of refreshing interest to the otherwise somewhat dry bones. Anyone who is investigating any form of headache, or the association of any particular conditions with cephalalgia, is sure to find some hint or working hypothesis in this volume. If the author had "boiled down" his material a good deal he would probably have written a much more valuable and interesting book, one in which his own individuality would have been recognisable; but then, perhaps, it would not have been so useful for the future workers for whose interests he expresses concern in his preface.

Analytical Records
FROM
THE LANCET LABORATORY.

CALIFORNIAN WHITE WINES AND BRANDY, BIG TREE BRAND.

(GRIERSON AND OLDHAM, 11, REGENT-STREET, W.)

So favourable to successful grape culture are the climatic conditions of California that no possible advantage could be gained by resorting to the fabrication of the really excellent wines which are now exported abundantly from that State to this country. As we have had occasion to point out already, the red wines are of a somewhat full though sound character, and they exhibit a delicacy of flavour which may be considered perhaps as slightly inferior to the wines of longer established vineyards. The white wines of California, however, samples of which we have lately examined, while exhibiting all the characters of a pure and genuine grape product, possess also a delicacy which we venture to think is in no degree inferior to the wines produced on the continent. Types of these, in addition to some already examined, are represented in Sauterne No. 6 and Hock No. 8, which, on analysis, gave the following results:—Sauterne, No. 6: alcohol, by weight 10·31 per cent, by volume 12·77 per cent, equal to proof spirit, 22·38 per cent.; extractives, 2·31 per cent.; mineral matter, 0·16 per cent.; total acidity, reckoned as tartaric acid, 0·69 per cent. Hock, No. 8: alcohol, 10·00 per cent. by weight, 12·40 per cent. by volume, equal to proof spirit, 21·73 per cent.; extractives, 1·90 per cent.; mineral matter, 0·20 per cent.; total acidity reckoned as tartaric acid, 0·67 per cent. No objectionable preservative agents could be traced in the foregoing. These wines are quoted at a very moderate price—and yet they may be relied upon as trustworthy and certainly wholesome. Not less satisfactory is the "folle blanche" brandy produced in California. It is a remarkably pure, mellow spirit, almost entirely free from extractives, and of a pale, delicate colour. On analysis the following results were obtained: alcohol, by weight 37·39 per cent., by volume 44·49 per cent., equal to proof spirit, 77·96 per cent.; extractives, 0·10 per cent.; mineral matter, *nil*. There is no reason to doubt that it is a genuine grape spirit possessing the peculiar ethereal fragrance of real Cognac.

WINE OF COD-LIVER OIL, CASCARA AROMATIC, DIKE'S PEPSIN IN SCALES.

(FREDERICK STEARNS AND CO., DETROIT, MICHIGAN. LONDON: T. CHRISTY AND CO., 23, LIME-STREET, E.C.)

Dissolved in the "wine of cod-liver oil" (Stearn) are the active principles of cod-liver oil, to the exclusion of the oil itself—a statement which a somewhat extended examination has to some extent confirmed. Thus on extracting the wine with ether and carefully treating the ethereal extract (which is an oily, brown, resinous body, having a peculiar fishy smell) with a strong sulphuric acid solution of glucose, the beautiful purple reaction characteristic of biliary constituents is obtained. The same reaction is effected when the extract used in the preparation of the wine is similarly tested, but to a more marked degree. Recent investigation has led to the isolation of several distinct bodies in cod-liver oil, notable amongst which are the alkaloids aselline and morrhuine, in association probably with morrhuic, formic, butyric, and phosphoric acids. These principles have been tested clinically, and the results formed the subject of an exhaustive report by Gautier and Morgues in the *Journal de Pharmacie*, March, 1890, who concluded that the combined active principles of cod-liver oil act as powerful stimulants of nutrition and assimilation, and show definitely the nature of the principles to which the oil to some extent owes its valuable medicinal properties. The wine evinces an acid reaction, is alcoholic, and contains also peptonate of iron. It is certainly an elegant preparation, and a success, viewed as a mere pharmaceutical preparation, but we cannot speak from experience of its clinical value. We should be interested to learn, however, the results of a careful clinical trial of this preparation, of which it seems to us to be fully worthy. Still more interesting would it be, perhaps, to ascertain the medicinal value of cod-liver oil from which the "principles" above described have been carefully abstracted. Evidence of this sort is, we think, essential to prove whether the claims urged in favour of a preparation of this kind are or are not extravagant. We presume, however, that the manufacturers do not go so far as to claim that this preparation may be regarded as an efficient substitute for cod-liver oil. The aromatic cascara preparation possesses a sweet attractive taste which may be referred to liquorice. The disagreeable flavour of the ordinary extract of cascara has been successfully obliterated, while there is no reason to think that its laxative action is in any degree impaired. It is obviously made to meet the requirements of those who are very susceptible to the effects of a nauseous or disagreeable flavour. Dike's pepsin occurs in beautiful transparent scales resembling benzoic acid, which are soluble in water to a practically clear solution. It possesses a saline taste, and in our experiments exhibited a remarkable degree of digestive activity upon hard white of egg. We have not examined a purer or more satisfactory pepsin.

LORETIN.

(BURROUGHS, WELLCOME, AND CO., SNOW-HILL, HOLBORN, E.C.)

"Loretin" is suggested as an efficient iodoform substitute, and is chemically known as meta-iodo-ortho-oxyquinoline-ana-sulphonic-acid, and like an acid forms on neutralisation with carbonate of soda a neutral salt easily soluble in water with an orange-red colour. The dilute (1 to 2 per cent.) aqueous solutions have been found to offer distinct advantages over carbolic-acid solutions for washing out wounds on account of the absence of odour, whilst the more concentrated 5 to 8 per cent. solutions have proved efficient, it is said, for the preparation of wet bandages for open wounds. It is a bright sulphur-yellow coloured powder resembling iodoform in appearance, but absolutely free from any odour. In water and alcohol it is only very slightly soluble, and in its powdered form is consequently a useful material for dusting wounds, over which, it is stated, it soon forms a solid crust. Loretin on heating gives off, we find, an abundance of violet iodine vapour, swells up into a carbonaceous mass, and finally burns completely away. So readily does it part with its iodine that its aqueous solution yields that element to chloroform when treated with ordinary oxidising agents.

DIASTISED MEAL BISCUITS.

(CALLARD, 65, REGENT-STREET, W.)

The microscope revealed whole wheat meal, chemical analysis showed a large proportion of both soluble carbohydrates and proteids, and the taste sufficiently indicated the presence of the bitter principles of the hop—results which accord with the statement of the makers that "they have introduced pepsine, malt extract, and hops into this wheatmeal biscuit." The biscuits have an attractive taste, are well baked, crisp, and of good texture. They possess excellent dietetic qualities, and the valuable food constituents which they contain are doubtless rendered more easily assimilable and nourishing from the fact that they have undergone partial hydrolysis and digestive change since they have been submitted to the action of the enzymes of both malt and the gastric juice.

FELS' GERMICIDE SOAP.

(FELS AND CO., PHILADELPHIA, AND LORIMER AND CO., BRITANNIA-ROW, ISLINGTON.)

In spite of the small but efficient proportion of antiseptic constituents contained in this soap, and of the difficulties of separating them from the complex fatty compound, we are able to confirm the statement that it contains methyl salicylate and mercuric chloride (1 in 2000) and sal alembroth (Lister, 1 in 2000), besides naphthol and eucalyptol, which give it an agreeable smell. By treating a strong solution of the soap with hydrochloric acid, and removing the separated fatty acids, a small but distinct globule of metallic mercury was deposited upon a slip of copper foil from the resulting clear solution when boiled. The same fat-free solution, when suitably treated, gave the violet reaction characteristic of salicylic acid (derived from methyl salicylate), with perchloride of iron. The soap itself is of excellent quality and neutral. The manifold uses to which it may be serviceably applied as an efficient antiseptic are obvious.

CATLEY ABBEY WATER.

(CATLEY ABBEY CO., DIGBY, LINCOLN.)

Catley Abbey water, which is described as the only British natural seltzer, possesses distinct merit and is derived from a well in Lincolnshire, and, according to our analysis, may be justly placed with the group which includes other well-known sparkling alkaline table waters. The constituents per pint are, we find, as follows: total solids 41·40 gr., bicarbonate of soda 8·82 gr., and salt 17 gr. The water is brilliant, well aërated, and has an agreeably fresh taste.

KOLA PEPTONE CAKES.

(H. BAHLSEN, HANNOVERSCHE CAKES FABRIK AND THAVIES INN, 1, HOLBORN-CIRCUS, E.C.)

The nutritive and restorative properties of the kola-nut, which are referred to the caffeine it contains, are well known, and several more or less successful attempts have therefore been made from time to time to incorporate the ground-nut satisfactorily with various forms of food and to prepare beverages with the extract. The kola peptone cake is an example of this kind, although in this preparation it is associated also with meat peptone obtained by digestion with papaya. The genuineness of the article is attested by the fact that we obtained a goodly crop of caffeine crystals when several cakes after suitable treatment were extracted with chloroform. The biscuits not only represent, therefore, a valuable form of food, but they contain also a desirable proportion of well-known stimulating and restorative principles, exhibited in an agreeable shape. The flavour in which kola may be recognised is pleasant, and the biscuits are well-cooked and desirably crisp. We must point out, however,

that the manufacturers are in error when, in contrasting the comparative alkaloidal value of tea, coffee, and kola in a table in a pamphlet accompanying the above samples, they state that the percentage of caffeine in coffee is 2·25, whereas it is seldom higher than 1·5 per cent.; while in tea it is only given as 0·43 to 0·46 per cent., when our own as well as other experiments have established[1] that the caffeine in tea ranges from at least 2·4 per cent. to 3·5 per cent.

"VINESTAL" AND ORANGE QUININE TONIC WATER.

(SOUTER, MACKENZIE AND CO., CRYSTAL MINERAL WATER WORKS, DOVER, FOLKESTONE, AND LONDON.)

"Vinestal" is the name given to an effervescing beverage which is claimed to possess refreshing and invigorating properties, because it contains a modicum of aromatic spirit of ammonia. On testing we found a small quantity of the ammonium salts indicated so that the water may be regarded as a very mild antacid, stimulant, and carminative. It should not be used, however, indiscriminately. The orange quinine water is strongly and agreeably bitter to the taste, and well charged with carbonic acid gas. It readily yielded quinine on treatment with an alkali and subsequent extraction with ether.

PHENOSALYL.

(BURROUGHS, WELLCOME, & CO., SNOW-HILL, HOLBORN, E.C.)

Phenosalyl is a clear, syrupy liquid consisting of a mixture of phenol, salicylic, and benzoic acids melted together and dissolved in lactic acid. It gives a marked colour reaction with perchloride of iron and is soluble in water and alkali. It is stated to possess an antiseptic power far superior to phenol, while it exhibits no corrosive action, as, for example, on surgical instruments, and it is readily soluble in water. According to Professor Fraipont, solutions of phenosalyl have no corrosive action on the skin, the mucous surfaces remain smooth and slippery, and do not become dried up, as is the case after washing with carbolic acid or corrosive sublimate.

New Inventions.

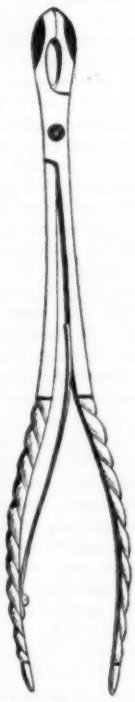
WHITE'S PATENT MASTICATOR.

THIS should be a very useful assistant to persons who are afflicted with defective teeth. It is unnecessary to point out that the thorough crushing of solid food before swallowing it renders the process of digestion much easier and thus hastens assimilation. Persons who are unable to masticate their food properly in the natural way will, we can understand, find the instrument a great help. To use the masticator it is held in an almost horizontal position with both hands and then worked like a pair of scissors. Of course the food must first be cut into small pieces on the plate with a knife and fork. Dipping the instrument during use from time to time into hot water will prevent it from chilling the food. It has, moreover, the merit of being easily taken apart for the purpose of cleansing. It is manufactured by Messrs. John Weiss and Son, of 287, Oxford-street, W.

NEW GOUGE CUTTING FORCEPS.

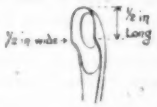
WITH regard to the method of prostatectomy published in THE LANCET of April 14th will you permit me to very briefly supplement what I then wrote? I have lately had made by Messrs. Hilliard and Sons a pair of gouge cutting forceps, the use of which considerably diminishes both the time required for removing the prostate and the risk of wounding the mucous floor of the bladder or urethra in those cases in which the prostatic tissue is unusually tough and adherent. With the guiding touch of two fingers in the bladder and the forceps in the perineal wound it is comparatively easy to "nibble" away the prostate as close up to the mucous wall as may be necessary without risk of perforation and without much expenditure of time. In the majority of cases, however, the use of these forceps will not be necessary, the prostatic tissue being soft enough to be detached by the finger or by a blunt elevator or a Volkmann's spoon. I append a rough sketch of the instrument, which is made in different sizes and both straight and curved on the flat beyond the hinge. The accompanying illustration represents a straight pair of medium size.

FIG. 1.



Actual size, 7½ in. long. Glasgow.

FIG. 2.



Within the last few days I have seen Professor Macewen remove the obstructing portion of a prostate by an extra-urethral perineal operation, and in speaking of it since he informs me that he has done this on several occasions during the past few years. As this proceeding, albeit attained by a different method, forms one of the essential features of the operation I performed, if not, indeed, the chief feature of it, I feel that this note should, equally with the original account of the operation, appear in the columns of THE LANCET.

JAMES H. NICOLL.

NEW HYPODERMIC SYRINGE.

THE accompanying sketch represents a hypodermic syringe I have devised, which is, I think, an improvement on most existing syringes. The piston-rod consists of a tube with a metal disc on one end, sliding on a solid rod also having a metal disc on its end. On the other end of this rod is a screw-thread, on which the handle of the syringe fits. When the handle is turned the discs of metal are drawn together, thus compressing the packing of the piston. This packing consists of two discs of leather with a pad of indiarubber between them, which on being compressed forms a most perfectly fitting piston. The leather discs, by fitting the cylinder of the syringe closely, effectually protect the rubber from the action of ether or alcohol if such is to be injected. This piston can be tightened even when the needle is actually in the patient. I have known the fluid to leak past the piston when making an injection. The syringe has given me more satisfaction than any I have used. Messrs. Arnold and Sons have carried out my idea excellently. They are prepared to supply similar syringes. The body, made entirely of glass, can be easily rendered aseptic.

EDWARD H. BRIEN, B.A., M.D., &c.

Rock Ferry.

[1] THE LANCET, July 1st, 1893

THE LANCET.

LONDON: SATURDAY, JULY 7, 1894.

ON July 5th, 1864, "the Committee on Chloroform" appointed by the Council of the Royal Medical and Chirurgical Society tendered its report to the Fellows of the Society. After an interval of thirty years, almost to a day, the same society has been asked to affirm again its judgment upon the action of this same drug. The commission of 1864 regarded chloroform as both a powerful respiratory poison and cardiac depressant, and in their instructions to administrators said: "The administrator should watch the respiration of his patient, and must keep one hand free for careful observations of the pulse." In 1894 the discussion turned upon the issue raised by Surgeon-Lieutenant-Colonel LAWRIE that the respiration alone needs watching, and that to make "careful observations of the pulse" is dangerous as well as unnecessary in that it dominates the mind with the fixed idea that cardiac failure is the one danger to be apprehended, and so does not permit of that close attention to the respiration which will, Surgeon-Lieutenant-Colonel LAWRIE affirms, always give the warning note should matters be going badly with the patient. As he expresses it, any warning given by the pulse is at best second-hand information, which should and could have been learned from the respiration had that function been properly watched. The discussion of last Tuesday is a historical one, and it was made so not only by the erudite gathering and earnest utterances of those who spoke, but by the fact that the meeting was indirectly the result of the enlightened action of an Oriental potentate. Dr. DUDLEY BUXTON pointed out that not only did the profession owe a debt of gratitude to the enthusiasm and untiring energy of Surgeon-Lieutenant-Colonel LAWRIE in his efforts to learn and teach the whole truth about chloroform, but had incurred a still greater debt to his Highness the NIZAM of Hyderabad, who had not only spent sums of money far beyond any which European dignitaries have devoted to the cause of science, but had himself personally watched the proceedings of the Commission held in his land, and proved himself a ready and generous friend to those who laboured in the cause of mankind in their endeavours to achieve some solution of the tangled maze of the chloroform question. This suggestion was subsequently put from the chair, and the Fellows of the premier medical society tendered to his Highness the NIZAM of Hyderabad the cordial thanks of the profession for his great services to medical science.

The main contentions upon which Surgeon-Lieutenant-Colonel LAWRIE relied in support of his thesis that chloroform kills always through respiration, were based upon cross-circulation experiments between animals so conducted that the blood of the feeder supplies the brain and therefore the medullary centres presiding over respiration and circulation, while the fed's circulation supplied its heart and all parts save its brain. Thus when the feeder was chloroformed the fed gave all the symptoms of chloroform inhalation, and in every case circulation persisted though respiration was in abeyance. And, secondly, he relied upon the striking analogy which seemed to exist between death from chloroform and death from bullet wounds of the brain. In this last case Mr. VICTOR HORSLEY had proved—and tracings exemplifying this proof were thrown upon the screen—that death is due not to syncope, as has always been thought, but to damage to the respiratory centre. It has been shown very conclusively that this centre is far more delicate and more easily thrown out of gear than its associated centres, and if the analogy is to be accepted it affords a striking argument in favour of Surgeon-Lieutenant-Colonel LAWRIE'S views. However, the cross-circulations established by him, and the tracings he obtained from them, failed to satisfy Dr. GASKELL and Dr. SHORE, who, as our readers are aware, have also made numerous experiments by this method. These observers contend that a more prolonged period of watching is necessary to obtain their results, and affirm that they are convinced that chloroform produces an enfeeblement of the circulation due to heart failure, even when no interference with respiration or pulmonary engorgement exists. The increased mortality under chloroform, to which several speakers referred, found a curious explanation from Dr. LAUDER BRUNTON. He referred to the recent work done in Russia, which showed that persons dying from chloroform were always those whose system was charged with excess of alkaloidal substances. The enhanced consumption of tinned meats, he suggested, possibly made more people thus obnoxious to chloroform, while the hardier northern races, who subsisted upon less animal food, were less prone to chloroform risks.

Dr. DUDLEY BUXTON gave it as his opinion that, at whatever result the academical dispute might arrive, the work of the Hyderabad Commission had certainly shown that the respiration was of the greatest importance in chloroform-giving, and he was inclined to believe that by far the larger number of deaths arose from careless administration. There were some deaths which apparently could not be explained upon the theory that the heart failed only secondly to the respiration; but possibly even these might later be explicable upon such a belief. The discussion is over. Whether some slight feeling of regret may exist that no very definite conclusion has been attained we cannot say, but there can be no doubt that, rightly or wrongly, those of the Fellows who spoke from the point of view of experts, with perhaps one exception, deprecated the teaching of the Hyderabad Commission. Surgeon-Lieutenant-Colonel LAWRIE has certainly made a good fight and has brought forward the results of much patient and careful work, and this has assuredly told. We hope this discussion will lead to good practical results, but much work has yet to be done, and we look anxiously for its speedy and earnest doing, knowing that our own keen interest in the question hardly needs emphasising. Mr. T. H. WAKLEY was one of the earliest investigators in this field, and his conclusions were, as Dr. LAUDER BRUNTON pointed out, in harmony with Surgeon-Lieutenant-Colonel LAWRIE'S contention; still, although we have made a notable advance, there must be no hesitancy

now; honest men, meeting together to discuss honest work, must sooner or later establish that which should be more precious to the medical mind than all else—truth.

AMONG the able addresses delivered at the recent International Medical Congress in Rome not the least instructive was that read by Dr. JACOBI of New York, a short abstract of which appeared recently in our columns.[1] Among the dangers threatening the best interests of medicine and the public good the lecturer placed "the multiplication of *such* specialists, especially in all the great cities of the world, as, neither from general study nor from a preliminary apprenticeship in general practice, can give security that they are in a position to judge the condition of or treat a special organ necessarily related to the whole body." A late well-known specialist, writing of his experiences in America, remarked that nothing impressed him so much as the number of specialists in comparatively small towns, a fact which convinced him of the good sense of the American people. He deplored the absence of even "a single laryngologist" in much larger towns in Great Britain. Dr. JACOBI has had abundant opportunity of witnessing the same phenomenon, but it has filled him with quite other emotions. The point of view alters everything except the object looked at. Is specialism an evil or is it not? The question thus raised is not new, and its examination on the usual lines would not be very profitable. It has too often been treated from too exclusive or partial a standpoint, and, as is frequently the case in the discussion of partial truths, warmth, and at times abuse, have taken the place of that calm reasoning which should characterise the argument for a strong cause or the sincere inquiry into a lasting truth. It is our desire on the present occasion to say a few words on this matter in all sincerity and guided by the light of what we conceive to be reason and experience. We hold a brief for no class interest and shall endeavour to speak to the best of our ability in promotion of the greatest good of the profession of medicine as a whole and of the public weal so far as it is related to it. It has been the privilege of this journal since its foundation, irrespectively of conventional usage, and at times at the sacrifice of some popularity, to speak plainly in the presence of what we conceive to be an evil prejudicial to the profession and the public, and we should be forgetful of the spirit of its founder, which we trust still inspires its pages, were we from other than a sense of justice to espouse one side rather than another in any controversy. We trust, therefore, that any who may differ from us in opinion will at least believe that our desire and endeavour are to hold the balance even.

As in most other questions, false analogy, "that fruitful parent of erroneous conclusions," has much to answer for in the development of current opinions on this subject. To argue from the *corpus juris* to the *corpus hominis*, or, from the division of labour in general to specialism in medicine, is manifestly illogical. The only industries which appear to us to have some analogy to the practice of medicine are those concerned with the management of the traffic on railways and on telegraphic and postal lines—employments, that is, in which a perception of the principle of continuity is necessary for the exercise of enlightened control. The intelligent station-master of even an obscure district should have a general knowledge of the system in which his post is a factor, as all roads lead to Rome or London as the case may be. Even so we contend that he who devotes his "best powers" to a study of the naso-pharynx, ear, or eye requires much more than a knowledge of the gross lesions of those parts or a certain excellence in manual dexterity. We do not, however, wish our attitude in this important matter to be misunderstood.

Time was when, like FRANCIS BACON, a man of average, or it may be superior, parts might traverse all the arcana of science—that is, of the knowledge of the period in which he lived—with some degree of completeness. Life, however, has not appreciably lengthened since that time, while art, which the Father of Medicine perceived to be long, has grown still longer, and that not by gradual increase, but within a few generations and with unprecedented rapidity. In medicine the patient remains a fixed point, or nearly so, but our knowledge of the vital processes of which he is the expression, and of the diseases which beset him, has been a rapidly widening circle, which threatens to escape—has indeed escaped—the field of vision of any individual, however talented. What conclusion should we draw from this? That the youth, more or less ingenious, who has received the alphabet of his professional education, when he is licensed to practise, should give up any attempt to scrutinise the widening circle to which we have referred and, approaching as nearly as possible some part of its circumference, rivet his gaze without loss of time (*because* life is short) upon *that* for the rest of his natural life? We think not. Such a one runs the risk of coming to regard the segment of a circle as a straight line—a part, in short, to be the whole, and himself probably as its most able exponent—and, what is of still more importance, of inducing some other people to regard him as such. The "Zeitgeist," according to the specialist we have already quoted, "believes the soundness of a man's knowledge is in the inverse ratio to its extent," and that protean spirit which sometimes assumes the form of a "flowing tide," and at others that of the "necessities of the situation," appears invariably to be on the side of those who appeal to it. Time, however, which as an abstraction may be external, when regarded from the point of view of the individual is but a fleeting moment, and its demands and desires need not be regarded as irrevocably fixed. The "Zeitgeist" is in the habit of changing its mind and, if unfavourable to us at the moment, will, we trust, with a little rational instruction become more amenable to reason. The same authority admits the cramping influence on the minds of some of cultivating a speciality, but concludes with a sigh of resignation that, as self-sacrifice may be a public duty, it may, alas, be incumbent on a specialist to withdraw the potential comprehensiveness of his vision from a wider field and focus it determinedly on a particular point. So disinterested an immolation extorts our sympathy. We cannot, however, rid ourselves of the belief that the centre of gravity of an inverted pyramid is, to say the least, precarious, and its upturned base a dangerous platform to rest upon.

In vindication of our impartiality, however, we hasten to

[1] THE LANCET, April 14th, 1894.

add that we do not suppose it possible in our day to find many who imagine they could, with reason or with benefit to the public, pose as the best authority upon the whole domain of medicine and surgery and expect to be regarded by others in that light. Such a "glorified general practitioner," we think, is an impossibility, and we should regard the mere ambition on the part of anyone to be such as an evidence of self-esteem approaching perilously near the pathological. Between extremes there is ever a mean, and the truth is wont to lie there. Whether men engage in pastimes or in professions, special aptitudes will evince themselves, and if these be fostered with industry they are certain to win an acknowledgment of superiority from others who either have not the aptitude in which a given individual excels or fai to cultivate it with that industry which is essential to all excellence. To possess acknowledged superiority in any sphere of thought or action is to be acknowledged also as an authority in that sphere. Reward follows as a matter of course.

The specialist to whom we have referred asserts wit reason that "for the average clever man there is little prospect of brilliant success unless he has (or can persuad the world he has) the power of doing some particular thing better than anyone else, or, at any rate, pre-eminently well." "Brilliant success," based upon the principle embodied in the above parenthesis, is, we admit, too common. It is not unfrequently observed in those who commence early that "self-sacrifice" of their intellects already mentioned. To this argument we would merely reply that the "average clever man" who does not fall far short of being in the majority has no right to expect to be brilliantly successful. If he occupy such a position a critical eye will soon detect that the giant's robe will have to be altered to fit the shoulders of him who wears it. If he attain average success, which he may reasonably expect, it will suit his average cleverness, and he ought to be contented.

We believe that the future belongs to the general practitioner and to that class of consultant the ultimate concentration of whose energies in one field or another is based upon the widest possible general culture and experience. The very term "concentration" implies a broad foundation, not a wide roof. The tree of knowledge, it is true, spreads as it rises, but its branches are proportionate to its stem and to attain seemly proportions require length of life irrespectively of the exigencies of the duration of art. The average clever man has not time to grow into the monarch of an intellectual forest. With the spread of medical education and the survival of the fittest in the struggle for life in an overcrowded profession the consultant of the future must of necessity, we believe, be one who will be *princeps inter pares*, not the member of a distinct guild in medicine or "an average clever man" prudently taking a short cut to "brilliant success." We believe, moreover, that, whatever the sphere in which he especially excels, he will continue to practise so much of his profession as never to lose the important relation of the whole *corpus dominis* to that portion of it his knowledge of which is admitted by the majority of his fellows to be superior to their own. In contradistinction to the abnormal specialism so frequently observed, we could regard a specialism evolved on the lines we have indicated as a normal growth, sound in all its parts, and capable of exercising a beneficent influence both on the profession and on the commonwealth. In much of the specialism of to-day we believe with Dr. JACOBI that there are unsound elements. It rests with the profession to eliminate these and to educate the public. When this is done we shall find ourselves in accord with the "Zeitgeist."

THE month of July and the first number of the second volume of THE LANCET for 1894, inevitably suggest thoughts of holiday, even to that most hard-working of all bodies of men—the medical profession. Medical practitioners were among the last men to fall into the belief that a holiday was necessary. We have known a medical practitioner in a country town who had practised for forty years, and whose only notion of a holiday was an interruption of his work caused by typhoid fever. We have known another who lived to a good age, and who grew impatient when asked about a holiday. "Why *should* I take a holiday—I am far happier at my work." But such cases are becoming more and more rare. And even those who do not care for holidays are practically compelled to take them—if not for their own sakes, for the sake of others whom they seldom see in the absorbing whirl of life's duties, and for the sake of public opinion, which rules that a holiday is one of the necessities of life. There is no doubt that a holiday is much more of a necessity than it used to be. The pace of life is quickened; the sense of responsibility is increased; the number of duties and functions is always multiplying, the crowd of fellow beings and our sense of relation and obligation to them is ever enlarging. With all our sanitary improvements and all the progress of medicine, the life of men—in their prime—is not improving in its security. According to Dr. POORE'S readings of the Registrar's returns, in our expectation of life after the first three decades there is a falling off. And to show that this has to do with the wear and tear of life, we have only to notice that it is most marked in urban communities. In the poorest, slowest, dullest counties there is an element that tends to the preservation of life, in spite of all disadvantages. All these facts tend to show that holidays are more of a necessity than they were. Besides, we have to recognise the growing view that it is proper to put into life a little more of the element of pleasure, of ease, of leisure than used to be thought right. Apart from the cultivation of luxury and selfishness, which will add to no man's longevity, it is right to contemplate periodical suspensions of labour and work. The man that works well is he who has the right to rest well.

> "The sweet vicissitudes of rest and toil
> Make labour easy and renew the soil."

Apart from the debated doctrine that a little less work will add to the financial value of the work done, the wise relaxation of tension and care will beneficially affect the worker's power and lengthen his opportunities.

But it is needless to press the point that holidays are necessary, or that they are so fashionable that we shall be thought singular if we do not take them. It is more difficult to know how they are to be taken on any such scale as to effectually break the monotony of daily work. We belong to a profession which does not "strike,"

and which has never been foolish enough to make a demand for a day's work of eight hours. Competition is nowhere more keen than it is in the medical profession, and that not in one branch of practice, but in all. In no other sphere of labour has indiscriminate charity done more to lessen the legitimate amount of work, and in no other is the work done less adequately remunerated or less promptly. To find means for an effectual holiday in such circumstances in exceptionally hard times is, indeed, no easy task; but it should be undertaken. Men to whom holiday-making is easy cannot do anything kinder than to encourage and facilitate by offers of help those to whom a holiday is a difficult thing. In no previous time were so many alternatives of holiday and so many facilities forthcoming. For two or three pounds the holiday-seeker can be transported to lands where the very difference in the conditions of life alone make a holiday. Some travel far: some are easier made content. To be able to dress, so to speak, in mufti, to have no patients to visit, to see our fellow creatures in other than clinical relations, to have no responsibilities for two or three weeks—these things constitute a holiday perhaps as really as travelling in strange places or foreign countries. And here we may comment with complacency upon the perfect freemasonry that exists in our profession. Wherever the medical man may go, if he visits a brother in the profession he may rest sure of a pleasant welcome and every fraternal attention. In no profession is there a more perfect sympathy and goodwill between the members than in ours, and in many a lonely strath or remote village may be found a man full of resource and wisdom, who has to be to his scattered patients consultant and general practitioner all in one, from whose store of practical experience all might well learn many a valuable lesson.

IT was recently announced at the Willenhall local board of health that a deputation, which had been received at the Local Government Board by Dr. THORNE THORNE and some of the permanent secretaries, had had communicated to them a somewhat important decision concerning the erection of hospitals for the isolation of small-pox patients. It is well known that since the receipt of the report of the Royal Commission on Small-pox Hospitals in 1882 the Local Government Board have refused to sanction loans for such hospitals unless so constructed as to consume and sterilise all outgoing air; and since then there have been a number of grave occurrences around small-pox hospitals, as at Leicester, Warrington, Halifax, &c., such as have gone to prove that the former experiences of Fulham were by no means exceptional. Indeed, at an important meeting of the Society of Medical Officers of Health held in Manchester last year the whole subject came under discussion, and in light of renewed and recurring experience a resolution was passed to the effect that: "It is desirable, in the interests of public health, that small-pox hospitals should not be in the same area as hospitals for the treatment of other fevers, and that they should also be at a distance from centres of population."

But it was also recently announced that the Local Government Board had at last granted a loan for a small-pox hospital, the case being that of Birmingham, where, in an isolated neighbourhood and on a site of between twenty and thirty acres, the corporation wished to erect a complete hospital which was to be altogether limited to the isolation of small-pox. The precise grounds on which this somewhat new departure was made did not transpire, but the communication made to the Willenhall local board may, perhaps, be regarded as an authoritative one. The deputation were told that if they desired to secure sanction for the erection of a hospital for the reception of small-pox cases, and from which cases of other diseases should be excluded, inquiry would be held as to the expediency of granting such sanction, provided the local board could show that there was not within half a mile of the hospital as a centre more than 500 inhabitants and not within a quarter of a mile of it more than 150 inhabitants. And it would seem that this new attitude has been taken up, not because a population so sparse would not run any risk of infection, but because vaccination could easily be offered individually to such comparatively small numbers, and that under these circumstances the advantages accruing to a community by reason of its having means for the isolation of small-pox would probably outweigh the mischief likely to result from the aggregation in hospital of cases of this specially potent infection. One thing seems pretty clear, and that is that a number of our town communities will not be able to find sites so sparsely populated as those indicated without going beyond their own areas; and both for this reason and for purposes of economy in dealing with a disease which may be absent for many years consecutively from a given district there would seem to be a distinct advantage in a number of adjacent authorities combining for the erection of a really isolated small-pox hospital, whatever other arrangements they may have made as regards the other infectious diseases likely to arise within their districts.

Annotations.

"Ne quid nimis."

THE PROPOSED TEACHING UNIVERSITY FOR LONDON.

AFTER a prolonged discussion, the delegates from most of the institutions interested in the scheme for the reorganisation of the University of London passed the following resolutions at a meeting at the Royal College of Physicians of London on Saturday last: "That this meeting of delegates from institutions mentioned in the report of the Royal Commission on the Gresham University desires to express generally its approval of the proposals contained in the report of the Royal Commission, and would urge on the Government that a Statutory Commission be appointed at an early date, with power to frame statutes and ordinances in general conformity with the report of the Royal Commission." "That a copy of this resolution be forwarded to the Lord Chancellor, the Lord President of the Privy Council, the Home Secretary, and the Vice-President of the Council, to be accompanied by a request that they will receive a deputation on the subject, the same to consist of the delegates to this meeting." Music and laws, as represented by their chief institutions, the Royal College of Science and the Technical

Institute of the City Guilds, consider their subjects as outside the scope of a teaching university, and Dr. Wace and Sir William Priestley, on behalf of King's College, were not authorised to express any opinion on the part of the council of King's College. The movement in favour of the proposals of the Royal Commission has at last been started, and it is clear that the majority of the Senate of the existing University of London and of the professors of arts and science are strongly in their favour. The delegates from the medical schools have also definitely thrown in their lot with the supporters of the movement, although in many cases with misgivings. The scheme, as it stands, will do nothing for the London medical student, except assist in lessening the number of his professional examinations, and this could have been done at any time by an agreement between the existing university and the professional corporations. With large discretionary powers, and a right of appeal to the Privy Council, the Statutory Commission, if appointed, may frame a working scheme for the amalgamation of the teaching institutions into something like a university for this metropolis; but we still fail to see how the interests of external students, which have hitherto alone been considered by the existing university, can be effectively safeguarded. The professors of arts and science desire a teaching university worthy of this metropolis which shall also examine for the empire, and, however much we may sympathise with their ideal, we must again point out that these functions are quite distinct, and will in practice be found incompatible. A large rearrangement of the details laid down by the Royal Commissioners must be made by a Statutory Commission, if any benefit is to come to the London medical student, and it seems to us that such a Commission is bound hand and foot by the suggestions in the report.

A GLIMPSE INTO THE NATURE OF THINGS.

BEAUTIFUL and interesting would hardly be suitable words to use in describing the experiments on phosphorescence at low temperatures shown by Professor Dewar at the extra meeting of the Chemical Society held at the Royal Institution on the 28th ult. It was the vision of future progress and the glimpses into the innermost nature of things that appealed to everyone present. Sir Gabriel Stokes, who made a few remarks at the end of Professor Dewar's lecture, was the first to give a satisfactory explanation of phosphorescence and fluorescence. If the molecules of a body vibrate in unison with the waves of light that strike them no phosphorescence is observed, but if their periods are different a fresh set of waves are produced which make the body appear luminous even after the original disturbance has ceased to operate. Phosphorescence and fluorescence are merely relative terms, depending on the length of time the luminous appearance is observed after outside light has been cut off. Professor Dewar began his lecture very appropriately by demonstrating the influence of extreme cold on the elasticity of different bodies. A soft metal helix, which would not bear the smallest strain without stretching at the ordinary temperature, was plunged with a hiss and a splutter into liquid oxygen at a temperature of -210° C. On its image being again thrown on the screen the Fellows saw that it remained as rigid as the hardest steel. Two tuning forks were next compared. When first sounded they appeared to be in perfect unison, but, after cooling one in liquid oxygen, rapid beats were heard on sounding them together. Iodide of mercury was shown to change from red to yellow when reduced to the low temperature. Photographic action, although reduced by some 80 per cent., is not extinguished at -210° C. It will be interesting to see how the sensitised plate will behave as absolute zero is approached. Professor Dewar occupied the rest of his lecture with comparisons between the phosphorescence of bodies at ordinary temperatures and after subjection to the cold produced by immersion in liquid oxygen. In every case there was a remarkable increase of luminosity at the low temperature. This is exactly what would be expected. As the rigidity of the atoms increases the phosphorescence should increase also. Organic bodies of complicated structure, such as bone, ivory, feathers, &c., gave a beautiful glow after cooling and exposure to the rays of the arc lamp. Pure water was hardly phosphorescent at all. Milk, on the other hand, appeared strongly luminous. Some of the platino-cyanides were very beautiful and, if we remember rightly, gave a reddish phosphorescence. Professor Dewar laid considerable stress on the marked influence a ketonic group, as chemists term it, exerts on the behaviour of an organic body. This is extremely interesting, as a ketonic group in the composition of an organic compound is credited by Professor Armstrong and other eminent chemists with having an equally strong influence in determining its colour. The difference between the phosphorescence of pyrocatechin and hydroquinone was demonstrated at the lecture. The latter of these two isomeric bodies is a ketone, and appeared far more luminous than the former. It is satisfactory to observe how modern hypotheses receive fresh confirmation from every new discovery. Professor Dewar's work on gases at low temperatures seems to be providing us with a new cornerstone for all our chemical and physical theories. The wave theory of light, the theory of the physical structure of matter, and the fruitful suppositions of the organic chemist all seem to be taking breath, as it were, for a fresh advance into the unknown. Let us hope that progress may not be less fruitful in the more obscure sciences that deal with organised life.

THE CENTENARY OF THE "INSTITUT DE FRANCE."

FEW anniversaries can hope to outrival the centenary of the "Institut de France," which will shortly be celebrated. Of the five "Académies" of which it is composed there is not one which has not laid one or other of the great subdivisions of intellectual and moral research under the deepest obligations. Medicine and surgery alone are indebted to it for some of their most precious and enduring conquests and in point of representative names have contributed to the membership a galaxy of genius and learning inferior to that of none among the sister sciences. Like everything French, the career of the Institut has been a chequered one. It was founded on Oct. 25th, 1795, by the Convention, to replace the several "Académies" which were suppressed by the decree of April 8th, 1793. Its aim was "the promotion of science and of the methods of investigation through the publication of discoveries and through correspondence with other learned societies; and, further, the encouragement of scientific works which would tend to the common weal and to the fair fame of the Republic." It consisted at first of three classes: (1) the mathematical and physical sciences, (2) the moral and political sciences, and (3) the fine arts and literature. Its members were 144, of whom 48 were nominated by the Convention, while the remainder were elected by these 48; it had also as many associates in the provinces and 24 foreign members. Every class was divided into six sections, with six members and six associates. On Jan. 23rd, 1803, the First Consul gave it a new constitution, by which the choice of members was subject to the approval of the head of the State, the second class was suppressed, and the whole divided into four new classes: (1) physical science and mathematics, (2) French language and literature, (3) the history and literature of antiquity, and (4) fine art. At the Restoration another change was effected. By decree of March 24th, 1816, Louis XVIII. gave the classes once more

the names of the old "Académies," which were thus distributed: (1) Académie Française, (2) Académie des Inscriptions et Belles Lettres, (3) Académie des Sciences, and (4) Académie des Beaux Arts. In 1833 the suppressed Académie des Sciences Morales et Politiques was revived as a fifth. The Institut, as now framed, has a common fund and a common library, but every "Académie" has its own jurisdiction and its own working bureau. The business common to the Académies collectively is transacted through a committee to which each "Académie" deputes an equal number of members, while the annual public sitting takes place on Oct. 25th. The Government defrays the cost of the publications of the Institut and grants each member 1200 fr. Such is the "Royal Society" (and more than the Royal Society) of France, and its centenary will be celebrated with a "pomp and circumstance" befitting its achievements and its aims. The committee appointed have already drawn up a programme, the main lines of which are as follows: 1. That invitations to the festivities shall be addressed to all the members, associates, and corresponding members, French and foreign. 2. That the *séance solennelle* shall take place (not, as originally contemplated, in the Grand Hall of the Cupola), but in the vast amphitheatre of the Sorbonne—a *séance* at which three special discourses will be delivered, one by the Minister of Public Instruction or his delegate, another by the President of the Institut, and the third by an Academician. Other articles of the programme, including a banquet, a *représentation de gala* at the Opéra or at the Théâtre Française, excursions, and such like, will be announced in the course of the summer. Meanwhile, we can only wish success to the celebration commensurate with the splendid history and epoch-making achievements of the Institut itself, which, under whatever State system it has lived and laboured—Republican, Monarchical, Imperial, and Republican once more—has never failed to do honour to France, and to enrich the world's resources in science, literature, and art.

DISEASE GERMS IN RAILWAY CARRIAGES.

AT this moment when so many persons are planning summer or holiday journeys and excursions, we may appropriately inquire what measures are being taken to purify the interior of railway carriages. That this is not a superfluous question is proved by the report published in the *Arbeiten aus dem Kaiserlichen Gesundheitsamte*, 1893, ix. 3. Drs. Petri, Kolb, and Friedrich have been collecting dust in railway carriages. For each sample they swept up the dust from one square metre of surface, and with the proceeds inoculated the peritoneum of 117 guinea-pigs. Three died from tuberculosis. They had been inoculated with dust taken from two sleeping-cars. One of these cars seemed fairly clean; the other, though recently restored, seemed badly kept. The other guinea-pigs were inoculated with the dust taken from all sorts of railway carriages. In nearly half the cases there was obvious evidence that the passengers had expectorated on the floors of the carriages, and the presence of the Koch bacillus was, as stated, proved in three cases. There were also numerous other pathogenic microbes found in this dust. In the fourth-class carriages the number of bacteria in the dust swept up from one square metre of surface was estimated at 12 624; in the third-class, 5481; the second-class, 4247; and the first-class, 2583. On the seats and partitions there were fewer bacteria—from 2646 to 29—and the roof was almost free. Though the third and fourth-class carriages are the most infected it was much easier to clean them. When washed with hot water and soap, and then wiped over with a sterilised cloth, the bacteria practically disappear; but for the better class carriage, with cloth-covered seats, this is more difficult. Nevertheless, it is recommended to wash the surface of the floor with hot water and soap. Undoubtedly the whole question of the hygiene of railway travelling has been greatly neglected. It seems as if we were still under the impression that a journey is altogether an exceptional event. The contrary is the case, for even persons who do not travel long distances are constantly making use of local trains. Yet no satisfactory means are applied for warming railway carriages and ventilating them without draught. As for the prevention of infection, that is altogether neglected in England. In Germany, in all the corridor trains there are spittoons on each side of every compartment. With the side entrance and small compartment this would not be practical. It is, therefore, all the more necessary to carefully and constantly wash the floors of railway carriages. The dust there formed and containing desiccated sputa is only too likely to be inhaled by the passengers. Thus the traveller may have greater cause to fear infection than to fear a railway accident.

DEATH UNDER CHLOROFORM.

A DEATH occurred last week at the West Norfolk Hospital, King's Lynn, after the administration of chloroform. The patient was a healthy-looking boy twelve years old suffering from stone in the bladder. Having been properly prepared for operation chloroform was administered and lateral lithotomy was performed. The anæsthetic was taken well, and no bad symptom arose during its administration. Between ten minutes and a quarter of an hour after it was stopped, and while the patient was coming round, he retched rather severely, the face becoming dusky. The chin was drawn up, about a drachm of green fluid was vomited, and respiration returned; no pulse could be felt at the wrist; four or five feeble breaths were taken (expiration could be felt with a hand over the face), then respiration ceased. The patient's head and chest were drawn over the end of the table and artificial respiration commenced, and two or three gasps were made. Artificial respiration was kept up for three-quarters of an hour. Faradaism and other restoratives were tried, but without good effect. At the necropsy no obstruction could be found in the larynx, trachea, or bronchi; the lungs were congested. The heart was sound—the right cavities distended, the left empty. There was a little pus in the pelvis of the left kidney and the bladder was hypertrophied. All the other organs were healthy in appearance.

THE COLLIERY DISASTER IN SOUTH WALES.

WHETHER or not the recent colliery disaster in South Wales was the result of pure accident will probably never be settled, but there is some evidence, we are sorry to say, that tends to show that the Home Office were blamably slow to act, if they acted at all, upon the excellent report of Mr. Hall. This report, as we have already seen, practically predicted disaster in the Albion mine if certain precautions duly and emphatically laid down were not taken. The report was issued on Feb. 8th and the substance of it appeared in THE LANCET of Feb. 17th, and yet the Home Secretary declares it was not received by the Home Office until May 23rd, 1894; and in answer to Mr. Pritchard's question in the House of Commons as to why steps were not taken immediately the report was received Mr. Asquith said there was no unusual delay and pointed out that the report came not from the inspector of the district but from the inspector of a neighbouring district and it was impossible in so short a time to give practical instructions on it. The time has not proved too short, alas, for a fearful calamity to happen in which nearly 300 lives were lost. The evidence in the report was convincing that a source of very great danger existed in the exceedingly inflammable and explosive dust of

the Albion Colliery, and the recommendation of the inspector to damp the mine and to use only high explosives for the shots should, in view of the tremendous issues involved, have been immediately enforced. We have no evidence that these precautions were taken, but we trust, as we expressed in an article last week, that the circumstances will be fully inquired into, and we sincerely hope, too, that the matter, so far as it relates to the apparent supineness of the Home Office, will not be allowed to rest. If delay has been due to "red tapeism," as from the Home Secretary's reply it would appear to have been, then no expression of censure sufficiently strong could be made against the Home Office.

WOOD PAVEMENT: HEALTHY OR UNHEALTHY?

So great an increase in facility of transit has followed the introduction of wood paving that we may safely claim for this convenient invention an established place in public esteem. It has, nevertheless, been attacked in certain quarters, and mainly on sanitary grounds. We confess to some scepticism in respect of objections which rest upon this foundation. So far no definite proof has been adduced to show that the evils complained of are attributable to the wooden roadway, and the fact that it does not more often require to be renewed is in itself a proof that its wear and tear are both slight and superficial. The blocks, moreover, are less liable to rot than might be supposed from their vegetable character, on account of their hardness, cross-cut shape, compact arrangement in asphalt, and even the hardened mire coating which results from the traffic which daily passes over them. It is needful also to remember that the detritus which mixes with street air, and to which a morbific influence has of late been so freely ascribed, is to a large extent not composed of wood dust, but of numberless other impurities inseparable from town refuse. Coming now to the evidences of disease, we are still unable to discover that there has been an increase of illness in wood-paved as compared with other districts. Obviously, therefore, the accusations levelled against our wooden roads on the score of health must, so far, be disallowed as not proven. If those objectors who believe them would gain acceptance for their views on this subject, they must support them by more definite statistics than they have hitherto brought forward. A method otherwise possessed of such evident advantages is hardly to be condemned by the expressed assumptions, however candid and sincere, of persons who have not thus proved the solidity of their suspicions.

OFFENSIVE CARGOES IN THE PORT OF LONDON.

THE corporation of London, in their capacity as port sanitary authority, have done work in regard to cholera precautions and the sanitary control of vessels, second to none in the kingdom, and we are glad to see that they are now taking steps to regulate the traffic of manure, fish offal, and other offensive cargoes over that part of the River Thames which lies within the confines of their district. The health and comfort of the vast seafaring community which frequents the lower reaches of the Thames cannot be a matter of indifference, and the necessity for proper control of nuisances is considerably enhanced when we keep in view the large number of Londoners who, during the summer months, daily seek pleasure on the Thames from London Bridge to the Nore. On June 26th an inquiry was held at the Guildhall, before Mr. Burd, one of the Local Government Board inspectors, into an application on the part of the corporation for an order empowering them to make by-laws for the regulation of vessels removing offensive cargoes within the district of the port sanitary authority. Representatives of the London County Council and of many of the sanitary authorities throughout the metropolis were present. The chief evidence was that of Dr. Collingridge, the medical officer of health to the port sanitary authority, who referred to the great nuisances which cargoes of fish offal, spent lime, dustbin refuse, and manure occasioned as at present transported; and he spoke of the possible spread of diphtheria by the agency of London manure, a subject which we have on other occasions discussed. In fact, Dr. Collingridge drew attention to so many nuisances that we trust the by-laws, if sanctioned, will be rigidly enforced. On this score, however, we have not much anxiety, since the port sanitary authority, with the assistance of their able and energetic medical officer of health and the funds at their disposal, should be able to overcome most obstacles. By the way, we notice that at a recent meeting of the Court of Common Council of the City of London a recommendation was brought up from the port sanitary committee that a medical officer should be appointed at a salary of five guineas a week for the purpose of medically inspecting vessels at Sheerness, the Rochester port sanitary authority to contribute £100 per annum towards the expense. As our readers are probably aware, the mouth of the Medway is within the limits of the port of London district, and all vessels proceeding to Rochester must first pass through the London district. Under these circumstances it certainly seems best to have a joint arrangement by which inspection may be efficiently carried out.

THE DIFFUSION OF SMALL-POX.

THE records of small-pox in London were again satisfactory last week, the number of fresh cases only being 15, whilst not one death was registered from the disease. The patients remaining under treatment in the institutions of the Metropolitan Asylums Board at the end of the week numbered 123, and those in the Highgate Small-pox Hospital 9, a total of 132, as against 227 three weeks previously, and 170 the week immediately preceding. The new admissions in the week were 16. The disease seems to have been got under in West Ham, where only 3 cases were recorded. News of one attack in Bristol reaches us after an interval of nearly three weeks. There has been a serious outbreak at Coventry, where the health officer has made a report in which he refers to the precautionary measures that are being adopted as incomplete by reason of the laxity of the guardians in regard to vaccination. The guardians have had his report before them, but have as yet taken no action in the matter. A recent death from small-pox in the city is the first for thirteen years. Upwards of a dozen cases were in hospital last week. Several cases were chronicled at Brinklow, near Rugby, in the latter part of June, necessitating the closing of the schools and the quarantining of two households. Numerous cases continued to be recorded at Willenhall last week, the first death in hospital, that of an unvaccinated child, having taken place on the 28th ultimo. A great deal of distress evidently prevails in the town, despite the efforts being made to supply the needed relief. The rush for vaccination and revaccination is described as having been very great. Mr. Hartill has replied to the request of the local board that he would retain his post of medical officer of health that he does not see his way to do so; and the board have now referred the whole matter of the office to the sanitary committee, with the object, apparently, of deciding what are to be the precise duties of the gentleman next filling the post. Such a procedure is not easily understood. A fresh outbreak at Walsall has come to light, the authorities having found it necessary to apply for an order for compulsory removal of one case to hospital. Three deaths from small-pox were registered in Birmingham last week, where the cases of the disease newly coming to the knowledge

of the health authority were again numerous. Several towns in the Midlands other than those here mentioned had attacks recorded in small numbers; and further northward Stockport was invaded again by multiple cases. In Lancashire, the heaviest numbers were at Manchester, where 26 attacks were heard of, with 2 deaths, the adjoining borough of Salford having 5 cases. Two labourers, who had passed through Rawtenstall, developed small-pox on reaching Blackburn, and have been the means of leading to an order for the vaccination of the 800 inmates of the workhouse and of all casuals seeking admission. At Rawtenstall itself several fresh cases have recently occurred, including the owner, deputy, and an inmate of a common lodging-house in which an infected tramp slept a fortnight previously. A death has taken place in the Haslingden workhouse of a man who slept under the same roof as the tramp who was refused admission to the workhouse a short time ago, and concerning whose uncontrolled wanderings so much stir was made. An inquiry into the case was ordered by the coroner. Preston had multiple attacks to record last week, and Darwen and Warrington each had a case, whilst in Yorkshire, Dewsbury had half-a-dozen cases, and other towns furnish information as to the disease. Across the Border, there were only 7 cases of small-pox notified in Leith in the week ended June 23rd, with 3 deaths; but the Grand Lodge Session of Good Templars, which was to have been held there in the early part of the present month, has been removed to Glasgow. In this latter city there were 5 cases of small-pox in the week in question. In the same week the disease continued unabated in Edinburgh, 35 cases having been recorded, and a temporary hospital has been resolved upon, in addition to the accommodation already existing. The disease has, however, since shown a disposition to abate. But much revaccination has been brought about by the prevalence among all classes of the community. Some amount of feeling is being manifested concerning the position of the small-pox hospital in the crowded locality of the Cowgate. Three cases of small-pox have quite recently called for removal to hospital at Dunfermline.

STREET BANDS AND HOSPITAL PATIENTS.

IT needs no argument to prove that mankind in general admire, and can—in some degree, at least—appreciate the charm of music. It by no means follows, however, that all have true musical taste or judgment in consorting other conditions with those of harmony. Tact in this latter process of adjustment is, indeed, not a purely musical faculty, but is related to other and higher moral qualities. Thus we find that the exclusive selfishness even of well-qualified performers is at times such as to annihilate much of the magic which their art, like that of Orpheus, would otherwise exercise. It is, therefore, not surprising that the gathering and marching strains of professional bands are often distinguished as much by want of consideration in their times and places of exercise as by the sacrifice of classical rules to vigour of execution. Such forgetfulness of other claims is never agreeable outside the circle of active energy. When, however, as in the following instance, it ignores the needs of sleepless and suffering persons it becomes a cause of direct injury. The secretary of St. George's Hospital had occasion recently to draw attention to the great inconvenience caused to inmates of the wards by the musical bands of processionists while passing the hospital. The rest of patients and nurses alike, making in the one case it might be the difference between convalescence and relapse, in the other constituting a chief essential of invaluable service, is liable to frequent and noisy interruption by this means. He therefore asks that the band-playing may be discontinued while processions are passing the hospital. Nothing could be more reasonable than this request, and we feel assured that local authorities in giving it practical effect will have the willing coöperation of those who have to do with the management of public demonstrations. We would suggest that, since this grievance of St. George's Hospital is shared more or less by every similar institution, the proposed regulation, which, it is to be hoped, will meet the case of the former, will also be applied to that of every other hospital.

THE PLAGUE IN CHINA.

WE have received further telegraphic information from our correspondent in Hong-Kong, from which it appears that little doubt is any longer entertained by scientific opinion in China as to the importance of the discovery by Professor Kitasato of a bacillus in the organs of those attacked by the plague. To say that Professor Kitasato is himself convinced of its specific nature is to infer that it has responded to all the tests that are essential to the diagnosis of a pathogenic micro-organism. Professor Kitasato has found the bacilli in great abundance in the bubonic swellings and in the spleens of the victims to the plague. The epidemic is stated to be on the decrease at Hong-Kong, but it is increasing at Canton.

PROFESSOR NOTHNAGEL AND THE VIENNA STUDENTS.

WE learn with feelings of pain and indignation that, owing to some steps taken by the authorities, the particulars of which are not to hand, the medical students of Vienna University have made a hostile demonstration against Professor Nothnagel, who happens to have protected the race which has furnished Germany with some of its most distinguished scientific men. The deplorable anti-Semitic agitation would seem to have penetrated that seat of learning; and because Professor Nothnagel has taken an active part in shielding Jewish students of medicine from the persecution to which they are subjected he himself is attacked, and prevented from carrying on his clinical work. We trust that the leaders in this outrage will be promptly dealt with by the authorities, for it reflects shame and discredit upon the university that one whose reputation is world-wide should be subjected to such insults. It may be remembered that Professor Nothnagel was one of those who delivered an address at the general meeting of the late International Medical Congress.

NÆVI AND MATERNAL IMPRESSIONS.

SINCE the days when a certain historic progenitor made large capital out of peeled saplings and probably from an even remoter age than his, there has existed among mankind a belief in the causation of birth-marks by previous maternal impression. A singular illustration of this fact is to be found in a case lately recorded by one of the American papers. The mother, an Italian, while pregnant was frightened by seeing a snake among some fruit which she was handling. In due time her child was born, and from birth displayed a peculiar mark upon the neck. This gradually assumed the form and appearance of a serpent, was deeply pigmented, and somewhat scaly. The tale is, indeed, a strange one. Had it come through any less reliable channel than a publication of the Transatlantic press we should probably have dismissed without question its pretentions to veracity. As it is we cannot resist the impression that facts and appearances must have been much exaggerated and altered since the original facts of evidence went on the ever-widening circuit of rumour. Nævi, it is well known, may occupy any part of the surface of the body, may vary indefinitely in shape, are usually pigmented, and frequently possess a thickened and rough integument. In view of these facts it is difficult, even with the aid of a description almost

circumstantial enough to find the mimic snake its place among the Reptilia, to resist a conviction that imagination has done much in this history to give colour and shape to a clinical curiosity. The whole theory of maternal impression, however appropriate, beautiful, or strange, partakes of a character too nearly related to allegory to secure for its revelations a place among the accredited discoveries of science.

ENDOWMENT AND RESEARCH.

THE Royal Institution, through the munificence of Mr. Ludwig Mond, F.R.S., has just been endowed with the laboratory for chemical and physical research that Faraday set his heart on fifty years ago. Mr. Ludwig Mond, both by his labours in the field of industrial chemistry, as a partner in the great firm of Brunner, Mond, and Co., who have developed the ammonia-soda process of alkali manufacture in this country, and also by his investigations in the field of pure chemistry, has himself earned an honourable place among the pioneers of science. As it requires an architect to appreciate the needs of a brother worker in raising some monument of stone and brickwork, so it would seem to require a chemist to appreciate the necessities of brother chemists in extending the edifice of science. The freehold of No. 20, Albemarle-street, adjoining the Royal Institution, has been acquired by the donor of the new laboratory, and is to be transferred to the managers of the Royal Institution. There will be room here both for the new laboratory and for an extension of the present library and reading-rooms. Mr. Ludwig Mond's generosity is not confined to merely providing the ground space nor does it stop at bearing the expense of converting the present building into an engine-house of science. Even the cost of the engines themselves, the wonderful instruments of precision with which the scientific explorer must now arm himself, is to be defrayed by the munificence of the donor. In addition to this, Mr. Ludwig Mond, with delightful modesty, desires that the new laboratory shall not be called after himself, but shall be named the "Davy-Faraday Research Laboratory of the Royal Institution." In referring to Professor Dewar's lecture on Phosphorescence at Low Temperatures in another column we speak of the physical sciences taking breath for a fresh start into the unknown: is it too much to hope now that fuel for the furnaces and oil for the wheels of progress will not be wanting?

THE WORKING OF THE CONTAGIOUS DISEASES (ANIMALS) ACTS.

HER MAJESTY'S Government have introduced into the House of Commons a short Bill to improve the machinery for working the Contagious Diseases (Animals) Acts. There are only nine clauses altogether. By the first it is proposed to give the Board of Agriculture power by general order to supplement or vary the procedure as to infected places and areas in the case of cattle plague, pleuro-pneumonia, and foot-and-mouth disease, with the view of making that procedure more elastic, and also to empower the Board to create any kind of district, zone, or space for the purpose of regulating movement and the holding of markets. The necessity for this latter power has long been felt, and from its wise and practical application much solid advantage is expected. The second clause is also an important one. Among other things it gives the Board of Agriculture power to make orders under the Contagious Diseases (Animals) Act, 1878, with regard to places where diseased animals are kept, although no infected place or area has been declared. It also enables the Board to deal with the disinfection of the clothes of drovers, dealers, butchers, and other persons employed in the cattle trade, and to enforce the use of precautions against the spread of disease by such persons. An important subsection of this clause gives the Board power to prescribe and regulate the destruction and disposal of carcases of animals slaughtered by order or dying while diseased or suspected of disease. There is also a distinct provision giving the Board power to prescribe and regulate "the treatment of diseased animals with dressing or other remedies by and at the expense of the local authority or the owner of the animals." Another clause in the Bill contains a number of regulations as to the landing of foreign cattle not intended for immediate slaughter, and another extends to the cases of cattle plague and all other diseases the powers of entry now exercisable in cases of pleuro-pneumonia, foot-and-mouth disease, and swine fever.

LAMINECTOMY FOR FRACTURE.

IN the *Philadelphia Medical News* Dr. Caspar W. Sharples records a case which at least shows the safety with which operation can be undertaken even in cases of severe fracture of the spine. The patient was a man aged twenty-eight who, while working in a small boat on the bottom of a steamer which was suspended over him, was suddenly, by the breaking of a rope, crushed by the steamboat falling upon him and, together with the boat in which he was working, immersed in the water. As he came up he caught the side of the boat and was saved from drowning. His legs were at this time paralysed, and the pain round his body was intense. When seen on the next day there was complete motor and sensory paralysis below the waist. The eleventh dorsal vertebra was the point at which the sensory impairment commenced. The bladder and bowels were also paralysed, and the pain around the body was very severe. Crepitus was distinctly made out at the eighth dorsal vertebra, and there was in this region much extravasation of blood. At the operation the laminæ of three vertebræ were removed; the cord was found bent at a sharp angle, while pieces of bone from the fractured vertebræ pressed upon it in front. Most of the body of the eighth dorsal vertebra, which was free, and also the loose pieces of bone, were removed. The dura mater was not opened. It was found impossible to wire the bones in position. The subsequent history of the case is uneventful. The patient rallied from the operation, but remained in a condition of complete paralysis below the iliac crests. The sphincters remained paralysed, and the legs are said to have become spastic. There was no pain, and the patient was able to sit, although he preferred to remain lying down. The case offers no noteworthy point, unless it shows how useless operation is in certain cases of fracture-dislocation of the spinal column, even when it is undertaken very early; but it is quite certain that in some cases of this character early operation is followed by much more favourable results than would be expected.

THE AERIAL CONVECTION OF SMALL-POX.

IN the last report of the Statistical Committee of the Metropolitan Asylums Board the medical superintendent of the Gore Farm Hospital offers that which he rightly describes as an interesting contribution to the controversy as to the aerial convection of small-pox. On the basis of his experience as to the absence of small-pox amongst the inmates of the fever hospital, which stood about 1000 feet from the small-pox hospital, he states that there is afforded "sufficient evidence ..... for assuming that the diffusion of small-pox through the air does not extend to a distance of 1000 feet." The editor of *Public Health*, in commenting on the report, reminds the writer of a source of fallacy which he himself indicates, for the report in question states that special precautions were taken only to send to the fever hospital "patients who showed evidence of previous vaccination." But it seems possible that there is a still more important

source of error. One of the conclusions laid down as far back as 1882 was to the effect that the diffusion of small-pox from a hospital had not shown itself "whilst the use of the hospital has been for convalescents only," and the Royal Commission on Small-pox Hospitals noted the "absence of danger in the accumulation of convalescent persons." Now the only indication which the medical superintendent gives as to the use of these two hospitals is that they were used "for the reception of *convalescent* small-pox and fever patients." And if this be correct, then the interest which attaches to the report is not that it proves anything at all as to the distance at which aerial diffusion takes place, but rather that it affords one more of numberless proofs in support of Mr. W. H. Power's contention that the diffusion does not take place at all, except when the cases of small-pox concerned are in the acute stage of the disease.

WE notice that Mr. George Meredith has inscribed his latest book—a much easier piece of reading, by-the-bye, than any he has recently vouchsafed to the public—to a surgeon. The words used in the dedication are four only, but they tell their story. We consider that the President of the Society of Authors has honoured our profession by his public recognition of his indebtedness to his medical attendant.

THE prizes and certificates of the Medical School were distributed to the successful competitors at Guy's Hospital on July 4th. Owing to Sir George Humphry's illness he was unable to present them to the candidates, and his place was taken by Dr. Clifford Allbutt, Regius Professor of Medicine in the University of Cambridge.

SURGEON-LIEUTENANT-COLONEL LAWRIE will give a demonstration of his method of producing chloroform anæsthesia at St. Mary's Hospital on Tuesday, July 10th, at 4.45 P.M.

WE are pleased to be able to announce that Sir George Humphry has made satisfactory progress during the past week and is now able to drive out.

Pharmacology and Therapeutics.

INJECTIONS OF BACTERICIDAL AGENTS.

THE cure or limitation of abscesses and other suppurative processes by means of liquid antiseptics applied over the part so as to be absorbed by the skin or boldly injected into and around the seat of mischief is very attractive in theory, but is generally found to be less satisfactory in practice. The injection of solutions of perchloride of mercury under the conjunctiva for purulent affections of the cornea is frequently followed by very unpleasant consequences, such as great swelling and violent irritation of the eye, severe and persistent pain, and sometimes by sloughing of the mucous membrane at the place where the injection was made. Thus, in sixty-five cases given by Dr. Gargarin in his dissertation on the injection of corrosive sublimate under the conjunctiva (St. Petersburg, 1893) twenty-three of the patients suffered from pain, and in eight cases partial sloughing of the conjunctiva occurred. The antiseptic action of such injections upon spots at a little distance from the point of insertion—as when the injection into the conjunctiva is given for an affection of the cornea—is somewhat questionable, as the mercury forms insoluble compounds immediately it is injected, and these can only very slowly pass on into the neighbouring tissues, when soluble double albuminates are formed, so that the mercury can hardly come in contact with the pyogenic microbes in sufficient quantity to affect them much. It is obvious, therefore, that in order to attain this end some other bactericide more generally diffusible and at the same time less destructive to the tissues of the body must be sought for. According to Karpoff, these advantages are possessed by parachlorophenol.[1] He found that the destructive action of parachlorophenol on microbes is greater than that of carbolic acid and cresol, though it is less than that of corrosive sublimate and nitrate of silver. It is, too, but slightly toxic, the lethal dose for a rabbit being as much as the $\frac{1}{1000}$th part of its own weight. From some experiments which Churiloff has made on animals inoculated with "Siberian plague"—i.e., malignant pustule—it would appear that subsequent injections of parachlorophenol retard the action of the virus, so that death does not occur so soon as it otherwise would. Thus he found that the average time the virus took to kill a rabbit was twenty-nine hours; by injecting parachlorophenol after, or both before and after, the virus in quantities varying from 0·4 gramme to 1·12 gramme, he was able to keep the rabbits alive for from thirty-four hours to five days, the length of time evidently depending on the quantity injected. In addition to these laboratory experiments,[2] some clinical observations have also been made which appear to bear out his views on the general action of parachlorophenol on disease produced by pathogenic microbes. Thus he successfully treated twenty-six cases of erysipelas by applying compresses soaked in a 1 or 2 per cent. solution of parachlorophenol. Professor Simanovski, too,[3] used this remedy for painting ulcers of the larynx with great benefit. On the other hand attempts made by Dr. Dolganoff to apply similar treatment to such diseases of the conjunctiva and cornea as granular lids and suppurative keratitis by painting the eye with solutions of parachlorophenol of the strength of from 1 to 5 per cent. were far from satisfactory, a good deal of swelling and persistent pain being produced and no improvement being effected. It was then determined to try the hypodermic, or rather subconjunctival, method, and six cases of abscesses or ulcers of the cornea of traumatic origin were treated by injections of a 1 or 2 per cent. solution of parachlorophenol. In all these, which are detailed in Dr. Dolganoff's paper[4] the diseased process was arrested and the lesion rapidly healed. Equally satisfactory results followed the use of similar injections in indolent serpiginous ulcers which refused to yield to ordinary non-operative measures. Not only did the parachlorophenol ultimately cure these, but it greatly relieved the pain at once. The quantity Dr. Dolganoff injects at a time is about fifteen minims—a Pravaz syringeful. He usually begins with the 1 per cent. solution, and a day or two afterwards gives a second injection with the 2 per cent. solution; this is repeated at intervals of two or three days until the ulcer has healed, which, in the cases reported, it did in from seven to sixteen days. He does not attempt to dogmatise as to the future there may be in store for this and similar methods of treatment, as the experience he has as yet had of it is very limited in extent, but he thinks himself justified in publishing the results so far obtained in the hope that other practitioners may be induced to make trial of these injections in suitable cases—that is where a pathogenic process probably due to microbes has to be attacked by an agent capable of destroying the vitality and reproducing power of these organisms. It is evident that if this method is of value in ophthalmic practice it is likely to find a far more extended field of usefulness in other domains of surgery.

DANGER OF CHLORIDE OF ZINC INJECTIONS.

The injection of chloride of zinc around a tuberculous joint—the so-called sclerogenic method—is by no means free from danger, as has been lately shown. The case[5] was that of a little girl aged six with tuberculous disease of the knee. Twelve injections of a 10 per cent. solution, varying in quantity from two to eight drops each, were made, and the limb was put up in plaster-of-Paris. Œdema of the toes and pain in the limb came on in two days. These symptoms continued to increase, and soon disseminated eschars appeared on the thigh and leg. One of these burst, and violent hæmorrhage ensued, which proved fatal. At the necropsy a large diffuse aneurysm due to the rupture of an eschar of the femoral artery, caused by the chloride of zinc, was found.

PHYSIOLOGICAL EFFECTS OF BICARBONATE OF SODA.

The effects of half a drachm of bicarbonate of soda taken twice a day have been recently studied by Dr. K. M.

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[1] Archives des Sciences Biologiques, ii., 3.
[2] Vrach, No. 23, 1894, article lxxi.
[3] Ibid., No. 8, 1894.
[4] Ibid., No. 23, 1894.
[5] Midi Médical, quoted in Nouveaux Remèdes, 8 Juin, 1894.

Leplinski,[6] with the object of determining the question whether this salt in medicinal doses has any effect on the assimilation of food or the metabolic changes in the healthy body. The food, urine, and fæces of ten persons were carefully weighed and analysed under ordinary conditions for a week, and then again for a second week, during which the soda was regularly taken. It was found that the assimilation of the nitrogenous principles of the food was very slightly increased, the proteid metabolism diminished, and the oxidation of the proteids more complete. The doses given did not produce any weakening effect or cause any difference in the amount of urine secreted or in the weight of the body, though it, of course, lessened to some extent the acidity of the urine.

IODIDE OF RUBIDIUM.

According to a writer in *Nouveaux Remèdes* (No. 10, 1894), iodide of rubidium may sometimes be substituted, with very satisfactory results, for the better-known alkaline iodides in the treatment of patients who do not bear the latter well. The price is, of course, high, being about three times that of the potassium salt, but the taste is much less disagreeable, and patients generally prefer it to all the other alkaline iodides. One patient who suffered from arterio-sclerosis was unable to bear any iodide except that of rubidium, but this he took for a fortnight without suffering any inconvenience. Another patient, who could not take iodide of potassium for more than a day without suffering from sore-throat and acne, bore the rubidium salt for nearly a week before these symptoms began to appear. A third, who suffered from recurrent syphilitic headache, could not take the ordinary iodides even in the form of suppositories without complaining on the second day of nausea, severe sore-throat, and weakness. When, however, iodide of rubidium was substituted these symptoms did not show themselves for five days, and then only in a milder form. The headache was thus cured in four days, a result which had previously never been obtained either by the employment of various artifices for rendering the iodides better supported or by analgesics, which latter class of drugs, of course, had no effect on the cause of the headaches. The observations of the writer of the paper, which follow up previous trials made in Germany, are not as yet very numerous or prolonged, but they seem to offer a hint in cases of intolerance to iodide of potassium.

THE LANCET

Special Analytical Sanitary Commission

ON THE

COMPOSITION AND VALUE OF COFFEE EXTRACTS.

A QUESTION of considerable importance was raised in our columns a short time ago[1] in a letter from a correspondent who, when summoned to a case of suspected poisoning by opium, was incidentally led to administer essence of coffee with excellent effect, as he stated, in the place of the freshly prepared infusion. He was, therefore, led to make the suggestion to our readers of using concentrated essence of coffee in any similar future emergency. In a letter which appeared in THE LANCET[2] a fortnight later another correspondent expressed doubt as to the wisdom of this suggestion, since "there is no reason to suppose that any of the so-called essences or extracts have any of the anti-narcotic properties of the genuine article." In support of this statement our correspondent referred to the words of a member of a "well-known New York firm" who is stated to have said that "what is generally known as essence of coffee in common parlance is a coffee colouring substance made from burnt sugar or molasses. The name essence of coffee is a misnomer." While we deemed it right to give this letter publicity, yet we could not fail to remark the strongly condemnatory nature of the statements it contained, and inasmuch as we were not entirely willing to believe that the manufacturers of coffee extracts invariably supply a spurious article, we publicly invited manufacturers to submit samples to us for examination in THE LANCET Laboratory in order to ascertain for ourselves their composition and nature, and thus to be in a position to decide this important point. The present report deals with the results obtained, which, as promised, we now present to our readers.

With regard to the literature on the subject, we find there is but scant information bearing upon either the *modus proscendi* adopted in the preparation of coffee essences or upon their composition. We may, however, briefly epitomise the information which we have been able to obtain. According, for instance, to Cooley's Encyclopædia (p. 529, seventh edition, revised by W. North, M.A., F.C.S., 1892), essence of coffee is a highly concentrated infusion of coffee prepared by percolation with boiling water, gently and quickly evaporated to about one-third or one-fourth of its bulk, and mixed with thick aqueous extract of chicory and syrup of burnt sugar, so as to give the whole the consistence of treacle. The proportion of the dry ingredients should be: coffee, four parts; chicory, two parts; burnt sugar, one part. It should be kept in well-corked bottles in a cool place. This preparation is very convenient for making extemporaneous coffee, but the beverage so made, though superior to that made in coffee-houses, is inferior to that we are accustomed to drink at home. Much of the so-called essence of coffee is simply treacle and sugar burnt with coffee. According to Allen's Commercial Organic Analysis (vol. iii., part 2, page 553, second edition, 1892), coffee extracts are prepared with very limited success by subjecting roasted coffee to treatment with boiling water or steam and adding the volatile products to the aqueous extract. The product is deficient in caffeine, and does not contain all the extracted matter of the coffee, nor, when diluted with the appropriate amount of water, is the colour the same as that of the freshly prepared liquid. To remedy this defect caramel is added together with strong alcohol as a preservative. In one preparation the addition of chicory and sugar is prescribed. Samples obtained by P. Domergue showed a variation in caffeine of from 0·04 per cent. to 1·06 per cent.; in extract dried at 100° from 13·7 to 41 per cent.; in mineral matter of 0·61 to 4·3 per cent. Domergue regards the proportion of caffeine as the best indication of the value of a coffee extract. Of three samples of coffee extract examined by G. L. Spencer one was destitute of caffeine, but contained cereals and other starchy bodies; a second contained 1·19 per cent. of caffeine, or about as much as ordinary coffee, and the third was a mixture of coffee extract with milk and sugar, and contained 0·72 per cent. of caffeine. The analysis of coffee extracts is beset with great and peculiar difficulties, and this probably accounts for the paucity of published analyses; the present report, therefore, may be justly regarded as an addition of some value probably to the history of the subject. It at any rate affords sufficient evidence upon which to decide on the point raised, that is, whether or not so-called coffee essences are, generally speaking, genuine coffee extracts.

The samples submitted to us were as follows, and will be afterwards referred to by the following numbers:—

1. Essence of Coffee, F. H. Smith, 21, Duke-street, Edinburgh.
2. Essence of Coffee with Chicory (Smith).
3. Pure Essence of Mocha Coffee, extracted and preserved by Thomas Curr, Aberdeen.
4. Essence of Coffee, John Bell & Co., 225, Oxford-street, W.
5. Essence of Coffee and Chicory, Symington & Co., Beaver Bank Works, Edinburgh and London.
6. Highly Concentrated Pure Coffee Essence without sugar (Symington).
7.[3] Prepared Taraxacum or Dandelion from the genuine dandelion root (Symington).
8. Finest quality Essence of Coffee (Symington).
9. Essence of Dandelion Coffee (Symington).
10. Optimus Coffee Extract, Clark's Optimus Coffee Works, Queen's-road, Lambeth.
11. Optimus Coffee Extract with Chicory (Clark).
12. Branson's Coffee Extract, London Chase Works, Clapham.
13.[3] Aqueous Ether Coffee separated at 120° F. (Branson).
14. Café Vierge, Allen & Hanburys, Plough-court, Lombard-street, E.C.

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[6] St. Petersb. Med.-Chir. Acad.: Dissertations. No. 2. 1893-94.

[1] THE LANCET, March 24th, p. 782.

[2] THE LANCET, April 7th, p. 915.

[3] This dandelion preparation existing in the form of powder was omitted from the examination as being outside the question at issue, as was also the interesting sample of "aqueous ether coffee" prepared by Branson.

According to our analysis, the composition of the foregoing samples is represented in Table I., in which has been placed also an analysis of a standard infusion of coffee made by infusing two ounces of best Mocha coffee with a pint of boiling water, the decoction thus representing a 10 per cent. solution, the proportion commonly adopted.

In this table it will be seen that the caffeine ranges from 0·11 per cent. in the freshly prepared beverage to 3·55 per cent. in the pure essence, the lowest amount in the pure coffee essences being 0·44 per cent., and in the mixed essences 0·23 per cent. The smallest proportion of caffeine is contained in the essences prepared with chicory, although the albuminoid constituents in these preparations is relatively high. On this account it is not difficult to detect chicory in a coffee essence, for although chicory introduces nitrogen it does not exist to any extent in the form of caffeine. The caffeine in chicory mixtures of essences seldom exceeds in our experience 0·30 per cent., while the total nitrogen is not less than 0·40 per cent.—an amount which may be contained in a genuine coffee essence of 0·50 per cent. caffeine. On the other hand, genuine coffee essences contain, according to this investigation, not less, and probably more, than 0·5 per cent. of caffeine. Coffee essences vary greatly in degree of concentration, as may be gathered from the wide range in amount of dry extract, the amount greatly depending upon the admixture of a larger or smaller quantity of foreign substances — such as sugar or burnt sugar. Sugar is added, we believe, to protect the essences from decomposition.

The comparative value, however, of coffee extracts, and also their value referred to the freshly prepared infusion, will be more easily understood when the composition of a breakfast-cupful (10 oz.) of ordinary coffee is contrasted with a cupful of coffee prepared with extract in which the *maximum* quantity of extract (two teaspoonfuls to a cupful—10 oz.) has been dissolved. The important differences which may exist between both preparations (coffee extract and the freshly prepared beverage) will then be seen at a glance. In Table II. the freshly prepared infusion is called the "standard infusion."

The results, on the whole, are satisfactory, since, in every instance, even in mixed essences, a distinct quantity of caffeine was separated, and, so far as the above preparations are concerned, they may fairly be taken as typical of English productions. There is no foundation for the statement, therefore, that "what is generally known as essence of coffee is a coffee colouring substance made from burnt sugar or molasses," or that the "name essence of coffee is a misnomer." In only one case, however—that of Sample 6, prepared by Symington, Edinburgh,—does the composition of the liquid, made from the essence in the manner directed, coincide with freshly prepared coffee made by boiling two ounces of the best crushed berry in one pint of water. Not in respect of caffeine only does this preparation correspond, but the other constituents, mineral and nitrogenous matters, are in fair accordance also. This specimen, however, must not be taken to represent what is usually offered to the public as an essence of coffee, since in a communication from Messrs. Symington we learn that it is prepared for the use of confectioners only, and is very concentrated and expensive. Still it is interesting to know that it is quite possible to prepare an extract which when dissolved in a suitable volume of water gives a beverage chemically identical with freshly prepared coffee. Nos. 14 and 1 are the next richest in caffeine, but to obtain the equivalent of a breakfast-cupful of good coffee twice the quantity prescribed (i.e., two teaspoonfuls per cup) must obviously be used. Close upon these amounts follow the preparations Nos. 4 and 8, which yield 1·1 per cent. and 1·54 per cent. of caffeine respectively. The rest contain an acceptable quantity of alkaloid, and afford excellent substitutes, though they are not so strong, and may perhaps be more freely recommended on this account, since there is a danger when there is an excessive amount of caffeine in the preparation of giving rise to symptoms of

TABLE I.—*Showing Percentage Composition of various Coffee Extracts.*

Sample.	Dried extract.	Mineral constituents.	Total Nitrogen.	Albuminoids.	Caffeine.	Remarks.
Standard infusion	2·10	0·26	0·04	0·09	0·11	10 per cent. infusion of best Mocha coffee.
No. 1	60·30	2·50	0·67	2·14	1·17	Pure coffee extract.
No. 2	82·40	1·50	0·41	2·01	0·30	Mixed essence with chicory.
No. 3	82·20	2·20	0·47	1·91	0 58	Pure coffee extract.
No. 4	19·00	2·20	0·50	1·57	0·87	Pure coffee essence.
No. 5	73·00	1·85	0·38	1·95	0·23	Coffee and chicory.
No. 6	67·40	10·00	2·17	7·30	3·55	Pure coffee; no sugar
No. 8	67·60	3·30	0·54	1·51	1·00	Pure coffee essence.
No. 9	64·10	2·15	0·65	3·27	0·47	Dandelion coffee essence.
No. 10	31·62	1·20	0·50	2·33	0·46	Pure coffee extract.
No. 11	36·00	0·80	0·40	1·89	0·31	Coffee and chicory.
No. 12	38·60	1·36	0·47	2·14	0·44	Pure coffee essence.
No. 14	40·70	3·92	1·09	4·35	1·35	Pure coffee essence.

TABLE II.—*Composition of a Cup (10 oz.) of Standard Coffee (10 per cent. infusion) compared with a Cup made with Extract of Coffee (two teaspoonfuls). The results are expressed in grains.*

Sample.	Caffeine.	Dry extract.	Mineral constituents.	Albuminoids.	Total Nitrogen.	Remarks.
Standard infusion	4·78	91·96	11·57	4·47	2·00	Ten per cent. infusion best Mocha coffee.
No. 1	1·72	89·33	3·85	2·00	0·82	Pure coffee extract.
No. 2	0·41	121·27	2·14	2·40	0·50	Mixed essence with chicory.
No. 3	0·89	127·51	3·39	2·10	0·57	Pure coffee extract.
No. 4	1·11	24·07	2·86	1·85	0·61	Pure coffee essence.
No. 5	0·33	108·16	2·73	2·33	0·46	Coffee and chicory.
No. 6	5·09	97·51	14·34	7·73	2·62	Pure coffee, no sugar.
No. 8	1·54	103·22	5·09	1·46	0·61	Pure coffee essence.
No. 9	0·70	98·28	3·25	3·67	0·80	Dandelion coffee essence.
No. 10	0·61	42·43	1·58	2·10	0·61	Pure coffee extract.
No. 11	0·41	47·52	1·08	2·33	0·49	Coffee and chicory.
No. 12	0·61	53·23	1·86	2·56	0·57	Pure coffee essence.
No. 14	1·84	56·16	5·40	6·06	1·51	Pure coffee essence.

theine poisoning known as "theinism," in which muscular tremor and cardiac disturbances are features.

It seems clear, however, that in the process of preparation in the generality of cases that caffeine at some stage or other is eliminated, as generally the amount found in the majority of essences is not commensurate with the degree of concentration. We think this is probably due to incomplete extraction, or still more likely to the separation of caffeine during concentration and its subsequent removal on filtration. In experiments we have instituted we have found that as a solution containing both tannin and caffeine is concentrated and cooled a body separates out—probably a compound of tannin and caffeine—and a considerably less amount of alkaloid occurs in the solution than was put in. Similarly a hot infusion of tea—especially Indian tea—when cooled yields a copious deposit, and the amount of caffeine in the clear cold suspended liquid will be found to be considerably less than in the hot liquid. In regard, however, to the special ground upon which this inquiry was founded there is no reason to believe that the coffee essences obtained from makers of repute in this country are not fitted to serve, as our correspondent suggested, as an anti-narcotic of very definite value.[4] When dissolved in the proportion prescribed it is true that some do not come up to the standard of a strong coffee infusion, but then the proportion in the case of poisoning could obviously be readily increased. For domestic use genuine coffee essences may be generally regarded to possess the stimulating properties for which they are consumed, not perhaps to the same extent as freshly prepared infusion, but sufficient for all purposes. They vary, however, greatly as regards flavour, aroma, and body.

THE LANCET Laboratory.

THE LONDON STREETS AND BUILDINGS BILL.

THIS Bill is exciting a considerable amount of interest during the course of its progress through Committee. Many important interests are represented, and every point of the Bill is earnestly contested. Under the conduct of the chairman, Mr. Stuart Wortley, its course is proceeding as vigorously as is possible under the conditions which regulate present parliamentary procedure. The interests of the Ecclesiastical Commissioners, the railway companies, and many of the important landowners are represented. The parts of the Bill dealt with up to the present are the provisions dealing with the formation and widening of streets and the position of new buildings in connexion with the proposals. The lines of building frontage, conditions of setting back, and the naming and numbering of the streets have occupied the attention of the Committee.

On Thursday last the question of the responsibility of the premises of railway companies in connexion with railway traffic was discussed. It was urged strongly that the companies should be exempt from that part of the Bill which relates to the construction of buildings, as they are exempt as to private roads "formed or laid out," and which is to be "used as an approach to a station yard or as an approach to any land used for railway purposes." It was pointed out that owing to the great value of land in London a custom of building hotels, managers' houses, and other accessory buildings had grown up, and that the fact of their applicants being railway companies was no reason why they should be allowed to contravene the requirements of the Act. It was thought necessary, therefore, that the General Buildings Acts should also apply to them. In reference to this we may observe that instances have frequently come to our notice of gross contravention of sanitary laws in connexion with buildings at railway stations.

The part of the Bill which more immediately concerns us is that portion which deals with the requirements necessary to secure a supply of light and air consistent with health. The Bill lays down provisions as to the air space to the rear of buildings and affords protection to smaller houses so as to prevent them from being completely overshadowed by the more stately piles of factories, warehouses, or workshops. A dwelling-house may be built up to within thirty feet of the boundary, but the Bill provides that a warehouse shall not be erected in a manner which shall cut off the light and air to which the dwelling-house is entitled. The Bill provides that no building exceeding 12 feet in height shall, without the consent of the council, be erected except upon a site previously occupied by the same class within 10 feet of the boundary line belonging to the owner of the adjoining ground. These provisions have applied for over three years to Liverpool and Manchester and many other large towns. London remains behind in this as in many other sanitary respects. For this purpose the Bill provides for a minimum of 150 square feet of open space at the rear of the domestic dwellings, this to extend laterally throughout the entire width of such building. The distance to the boundary of adjoining lands shall not be less than 10 feet. It contains regulations for determining the height of new buildings. The county council endeavoured to obtain the sanction of the Committee to the angle of 45° as recommended some time ago under the model by-laws of the Local Government Board. This angle would ensure the lines drawn from the highest points of opposite buildings meeting at a point in front of the centre of both so as to form a right angle.

With reference to block buildings or dwelling-houses constructed or adapted to be inhabited by more than two separate families the plans will have to be submitted a month before the commencement of the erection to the officers of the county council. They will require to show the relation of the proposed structure to the buildings adjacent to it. If the council are not satisfied that the proper conditions for a sufficient admission of light and air have been supplied they may decline to sanction the plans and prevent the building from being erected. Provision is also made for securing that these blocks of buildings shall not be enclosed by buildings of the warehouse class. This class of structure shall not approach nearer to a dwelling-house than 20 ft. of its boundary. Plans for the erection of domestic buildings on old sites will require to be sanctioned by the district surveyor. The ventilation of enclosed courts is to be provided for by a clear opening or openings, having a total sectional area of not less than fifty feet, placed within twenty feet of the level of the pavement of the adjoining street or open space. This part of the Bill deals with several important requirements in relation to the chimney shafts, close fires, accesses and stairs, and their proper ventilation. Common staircases "shall be ventilated upon every storey above the ground storey by means of windows or skylights opening directly into the external air." Habitable rooms are to be not less than eight feet in height from the floor to the ceiling, and the windows shall open to the external air. In the Bill it is proposed that as regards new buildings, which may include a re-erected building, it is not to go to a greater height than the width of the adjoining street. If a building at present stands greater than the width of the adjoining street it may be re-erected subject to the seventy-five feet limit. The importance of these points was borne out by the expert evidence given respectively by Dr. Longstaff, Mr. Shirley Murphy, and Professor Marshall Ward.

The ground upon which objections were urged to the adoption of this portion of the Bill were very various. It was said that it interfered with all the property in London, the rateable value of which amounts to £33,000,000 sterling. The health of London compared favourably with that of cities in which these principles had been adopted. Disease, no doubt, maintained some ratio to overcrowding, but there was, it was incorrectly stated by the petitioners, no evidence of this in London. It was said that the effect of the Bill would be such as to force people to do what they could to evade a law which they thought unreasonable and unjust. Another result would be to increase the cost of erection and to send a still greater number out of London for dwelling purposes. Mr. Littler pointed out that the Bill asked powers to remedy grievances which had not been shown to exist. On behalf of the owners it was urged that the enactments intended primarily to apply to the working-class dwellings, and to cure evils existing in them, interfered also with the best class of property. Thus, not a single one of the new improvements carried out upon the Duke of Westminster's Estate could

[4] A point of probable importance in the administration of coffee in poisoning by opium is occasionally overlooked—that is, that the tannin of coffee probably plays an important *rôle* as an antidote, since this body renders alkaloids insoluble by forming tannates. Again, if the anti-narcotic properties of coffee are due to caffeine, the antidote effect being assisted also by tannin, there is no reason why tea should not serve as an equally useful agent; it contains a far greater proportion of theine, and also more tannin. The essential oils of coffee doubtless contribute substantially to its stimulating effect.

have been proceeded with under the proposed clauses without serious interference. The provisions of the Bill, it was urged, put a premium upon owners perpetuating old buildings and in maintaining the narrowness of the streets, inasmuch as the setting back would imply the largest and most important portion of the building space. At present the Duke of Westminster makes a point of widening the streets to forty and sixty feet, giving, in the meantime, the extra land to the public benefit. This would, it was alleged, become impossible under the conditions of the rear angle. The council insisted that open space was essential, and that the action of air and light was necessary for the health both of the individual and of the populace. The proposals were said to be necessary for health and sanitary reasons, and perfectly fair and just between the regulating authority on the one side and the owners on the other.

Regarding the section devoted to the principle of fixing a building angle at the rear of buildings, this was acceded to by the Committee with some reservations. The Committee have decided that in cases falling under the clause which deals with this provision, the minimum of the county council requirements should be an angle of 63° from the ground level, and in the case of new buildings erected on old sites the requirements should be 63·20° from the level of the ground floor ceiling. The county council are not, therefore, to require owners to conform to anything more onerous than the conditions of Clause 33 as amended, notwithstanding that they may enable them to build upon ground not now built upon. Regarding the height of buildings, the county council agree to the present condition of the law, reducing, however, the height as it now stands from 90 ft. to 80 ft.

THE ARMY ESTIMATES.

THE House of Commons went into Committee of Supply on the Army Estimates on Tuesday evening, and, as will be seen by a reference to our parliamentary column, a number of interesting points arose in the debate on the vote for £290,000 for the army medical establishments.

The subjects introduced and discussed included questions affecting the medical examination of army candidates, the frequent changes of principal medical officers at different stations, the desirability of a little more promotion by selection and merit than obtained at present in the Army Medical Service, the increase of opportunities and facilities for professional study and attendance at hospitals on the part of the medical officers, the sanitary condition of Woolwich Arsenal, and last, though by no means least, the case of Surgeon-Lieutenant-Colonel Briggs. These, and other matters which cropped up for consideration, occupied a considerable amount of time and attention. They one and all possess an interest for army medical officers, and we may consequently make a few brief comments upon them.

As regards the medical examination of army candidates, absolute uniformity of result can scarcely be expected on the part of medical boards, but it seems to us that if the standard of requirements be as plainly set forth as practicable, and the regulations be clearly laid down and invariably adhered to, something like uniformity of practice should be attainable. We suspect that other than purely medical or regulation considerations have sometimes come into play, and that efforts have been occasionally made to get medical boards to reconsider or set aside their judgment where the candidate possessed interest and influence. Be this as it may, the regulations might surely be drawn up sufficiently clearly to enable any intelligent medical man to form a fairly accurate opinion and estimate the probable chances which a candidate would have of successfully passing the medical examination for the army. The tests for vision certainly do not err on the side of being too severe, and they are laid down with sufficient clearness. The fact is that the supply of candidates for the army, at the present time especially, is far in excess of the demand, and the great changes which have taken place in modern warfare and its weapons have increased the importance of the application of physical tests and raised the standard of physical requirements for army candidates until young men are expected nowadays to be not only free from all present physical defects but without any ground for suspecting their future occurrence. The avenues to the services are crowded with candidates, and the medical examinations have from this and other causes grown, and been growing, more and more strict.

With regard to most of the other points discussed in the House, it is unnecessary to set forth our views, as our readers are already acquainted with them. But we may say, generally, that we think it is to be regretted, as far as the efficiency of the service is concerned, that principal medical officers are so frequently changed, that a certain amount of promotion by selection is desirable as well as in accordance with the intention of the regulations, and that medical officers should have greater facilities for maintaining and increasing their scientific knowledge than they possess at present. It is obviously desirable, also, that the head of a large medical service should visit military stations from time to time and inspect the work that is going on in them; and it goes without saying that every facility should be given to the medical service for rehearsing in peace the duties that will have to be discharged in war.

Touching the case of Surgeon-Lieutenant-Colonel Briggs—that this officer had been subjected to hard treatment was fully recognised by Mr. Stanhope, the late Secretary for War, in the frank and handsome terms he used in the House when this officer was reinstated in the service; but the present position of affairs is not easy to understand exactly. Mr. Campbell-Bannerman was emphatic in his declaration that Surgeon-Lieutenant-Colonel Briggs had been dealt with in strict accordance with the terms of the warrants and regulations applicable to his case, and that he had been treated exactly in the same way as officers promoted with him at the same time; and he added that there was not the slightest ground for suggesting that the Commander-in-Chief had interfered in the case, or that His Royal Highness had ever been influenced, directly or indirectly, in any way by the unhappy circumstances in which Surgeon-Lieutenant-Colonel Briggs had been placed.

The contention raised in the House mainly hinged on the interpretation of existing warrants and regulations. A medical officer's rate of pay and pension is, it is alleged, regulated by length of service and not by rank only, and it was contended that Surgeon-Lieutenant-Colonel Briggs had really obtained all that he was actually entitled to under the circumstances. It is only fair to add that the ruling of the War Office authorities in this respect seems to have been generally acquiesced in by the members of the House. Whether the regulations require to be amended or governed by another principle is really beside the question at the present time. The question to be decided was whether the existing regulations had been fairly and honestly interpreted and applied to this officer's case? It is agreed by all that Surgeon-Lieutenant-Colonel Briggs had rendered conspicuously good service in Egypt and elsewhere, and that he had behaved with a chivalrous sense of truth and honour in a case with which his name was improperly and unfortunately connected some years ago.

A VISIT TO HAMBURG:

THE CHOLERA EPIDEMIC, THE SLUMS, POVERTY, AND DISEASE.

(FROM OUR SPECIAL CORRESPONDENT.)

THE complete contrast between Hamburg and Berlin strikes the visitor the moment he leaves the railway station. At Berlin all is new and modern in style; at Hamburg the quaint and antique abound on all sides. To the artist and the archæologist Hamburg must be infinitely more attractive; to the sanitarian a few minutes in Hamburg suffice to show that it must contain many hotbeds of disease. Not only does the town lie low, on a level with, and in some parts below, the high tides of the Elbe, but there are on all sides canals filled with black-looking water, where the falling tide lays bare, under the windows of dwelling-houses, a slimy mud over which rats hold nightly revels. Then there is any number of tall old Dutch houses, grouped in artistic confusion, with their gabled roofs and fancy shapes so varied in design, but where air space is scarce, ventilation at a discount, and poverty, overcrowding, dirt, and neglect become the rule. The drive from the station to the hotel, without the aid of any technical investigation, suffices to show that there is nothing unlikely or surprising in the fact that this town, more than all others, favoured the spread of

THE SUPPRESSED PHOTOGRAPHS OF THE HAMBURG CHOLERA DISTRICTS.

Prof. v. Pettenkofer:
„Was ich in Bezug auf Wohnungs- und Ernährungs-Verhältnisse in Hamburg gesehen habe spottet jeder Beschreibung!"

Prof. Koch:
„Meine Herren ich vergesse ganz, daß ich mich in Europa befinde!"

Senator Dr. Mönkeberg:
„Hamburg ist in sanitärer Beziehung vorzüglich!"

cholera. It is difficult at Berlin to find out the slums; at Hamburg they abound on all sides in picturesque profusion. A glance also at the cholera maps of Hamburg at once indicates that it was precisely in these slums that cholera prevailed with appalling intensity. The contaminated water-supply was distributed all over the town and there were cases of cholera in every direction, but the greatest havoc was wrought in the numerous courts and alleys, in the rookeries and the slums. Had it not been for these abominations the cholera epidemic would never have assumed so deadly an aspect. It is good, it is urgent, to secure a better water-supply, but it is more necessary to rehouse the poor of Hamburg.

The Hamburg official medical statistics show that the death-rate corresponds with the incomes of the sufferers; they also show that in dark, wet, damp, narrow, ill-ventilated courts there was the most cholera. They further prove that where good, sound, healthy houses were inhabited by dirty, careless people there were but few cases of cholera, but where clean, careful people lived in unwholesome houses there were many cases of cholera. In the face of this official statement we must not say that the people alone are to blame; it is the structure, the position, the ventilation of the dwelling that we must study. Such investigation must invariably include a knowledge of the conditions of the subsoil. Though the effect of the subsoil at Hamburg may be difficult to estimate, because of the great traffic and because people do not remain in the same place, nevertheless there are some statistics forthcoming that are very significant. The districts nearest to the river are on damp, marshy soil, and in these districts there were in the 1892 epidemic 29·33 cases and 16·17 deaths from cholera per 1000 of the population. In the districts further from the river, situated on drier ground, there were 21·65 cases and 10·84 deaths from cholera per 1000 of the population; but there are many other factors to be considered besides the dampness of the soil. It is precisely on the dry soil that the wealthier sections of the population live. The wealthy have less children, more air space, and take greater precautions; indeed, ever since the typhoid fever epidemic of 1886 many of these families contracted the habit of boiling all the water they use for drinking purposes. More significant are the statistics of three districts which are partially on damp soil and partially on dry soil. Thus, in the Borgfelde district there are 11,177 people living on dry soil, and there were 25·55 cases and 13·22 deaths from cholera per 1000 inhabitants. In the same district 5192 persons live on damp soil, and there were 31·39 cases and 17·53 deaths per 1000. In the Hamm district the proportions were 4927 persons on dry soil, 18·06 cases, 9 15 deaths; and on damp soil 8329 persons with 39·38 cases and 21·37 deaths per 1000. In the Horn district, on dry soil 3186 inhabitants, 10·36 cases, 5·96 deaths, and on the damp soil 1257 inhabitants, 11·14 cases, and 7·16 deaths per 1000. From this it will be seen that, in the same districts, not only was the frequency of cholera greater where the houses stood on damp, marshy soil, but that the cases were more severe, for a smaller proportion of persons recovered.

The intimate connexion between income and cholera is also very clearly established. As regards persons with less than 800 marks per annum, who are for the most part single men, there is a smaller proportion of deaths, but above that figure and up to 2000 marks we reach the poor families and there the death-rate is highest.

Income.		Census of 1891.	Cases reported.	Deaths from cholera.	Proportion per 1000 of population.	
					Cases.	Deaths.
Over 600 mks.	Under 800 mks.	47,447	1,575	873	36·25	20·09
800 ,,	1,000 ,,	28,647	3,264	1,772	113·94	61·86
1,000 ,,	2,000 ,,	43,848	4,396	2,425	100·25	55·30
2,000 ,,	3,500 ,,	14,544	685	389	47·10	26·75
3,500 ,,	5,000 ,,	6,125	243	135	39·67	22·04
5,000 ,,	10,000 ,,	5,649	175	88	30·98	15·58
10,000 ,,	25,000 ,,	3,329	60	32	18·03	9·62
25,000 ,,	50,000 ,,	1,182	20	13	16·92	11·00
50,000 ,,	—	834	5	4	6·00	4·80
Total		147,604	10,423	5,731	70·61	38·83

There are also tables showing the average income received and the average rents paid in the various districts. Put in this manner, the comparison between the prevalence of cholera and the rent paid and income of the inhabitants is not so striking, but this is due to the influence of suburban life. The same lesson is taught, but by studying the figures relating to the rich rather than by those describing the condition of the poor. In many outlying districts the rents paid are low, the incomes are small, but there are more air space, smaller houses, and larger gardens and yards, and therefore less cholera. For instance, in the Horn district no less than 78·44 per cent. of the population pay rents that vary from 90 to 300 marks per annum, and the average earnings or income of the district is only 274·9 marks. Yet the proportion of cases of cholera was under 15 per 1000 and the deaths under 8 per 1000. Dividing the districts of Hamburg into ten categories, this, in spite of its poverty, stands third best on the list. Now, if the Harvestehude district be taken I find that only 8·31 per cent. of the population paid the lowest figure in rents—that is, from 90 to 300 marks per annum—and the average income in this district is the highest in Hamburg—namely, 3155 marks. The proportion of cases of cholera was under 10 per 1000, and the deaths under 6 per 1000. In the Billwärder-Ausschlag district 66·20 per cent. of the population pay from 90 to 300 marks rent, and only 1·29 per cent. from 600 to 1020 marks rent. The average income is 270·9 marks. The proportion of cases of cholera was 40·13 per 1000 and of deaths 24·16 per 1000. In the Rotherbaum district only 9·23 per cent. of the population paid from 90 to 300 marks rent, and 26·44 of the population paid from 600 to 1020 marks rent. The average income of the district is 2310 marks per head. The number of cases of cholera was 11·38 per 1000 and the deaths 5·91 per 1000.

Unfortunately the authorities at Hamburg, instead of profiting by the very obvious lessons the cholera epidemic has taught, have concentrated all their energies on the question of water-supply. In this direction they have acted with laudable energy and have not allowed the question of expense to prevent the construction of the requisite filters. It is, however, equally necessary to condemn, pull down, and reconstruct large areas of slum property. In this respect not only has very little been done but the authorities have shown a degree of intolerance of criticism that will hardly be credited in this country. During the cholera epidemic a photographer took several photographs of some of the worst property. These he printed and sold, and he added to the pictures three quotations concerning the housing of the poor at Hamburg. First there are the words of Professor von Pettenkofer: "What I saw in Hamburg of the conditions of dwellings and of food defies all description." Then follow the words of Professor Koch: "Gentlemen, I forget that I am in Europe." Underneath, and in contrast with these high authorities, there is a quotation from Senator Dr. Monkeberg (the town councilmen of Hamburg are called senators). This local authority declares, on the contrary, that "Hamburg from a sanitary point of view is in a first-class condition." To these three quotations no comment was added. The public were left to judge from the photograph. This very simple but effective method of criticism gave such dire offence that the unfortunate photographer was arrested and, I was informed, had been fined 600 marks. The photograph was suppressed, and the shopkeepers of Hamburg no longer dared to offer it for sale. On hearing this story I naturally made a point of procuring the photograph. Of course this was extremely difficult. Its purchase was quite out of the question, but I ultimately succeeded in procuring a copy of the forbidden picture. It suffices to say that the accompanying illustration is a faithful reproduction of the same. By its suppression the town authorities of Hamburg appear to plead guilty to having neglected the housing of their poor, for in this instance the French proverb seems more particularly to apply—namely, that "it is only the truth which offends." Perhaps now that the excitement and the bitterness caused by the cholera epidemic have had time to subside the Hamburg authorities will take a more lenient view and may be induced to offer some apology and compensation to their photographic critic. If not, why should they not also prosecute Professor von Pettenkofer and Professor Koch?

Naturally I made a point of visiting the slums where there had been the most cases of cholera, and I must plead guilty to having also taken some photographs. I visited more especially the district on the water side between the Schaarmarkt and the gardens of St. Pauli. Here, giving on to Eichholzstrasse, are

a number of deep, narrow, over-populated courts. These are better known by their nicknames, such as, for instance, the Kattenhof or the Cat's-court, a place paved with nubbly flint stones where there are houses four storeys high with attics above and no through ventilation. The staircases are narrow, precipitous, and in some instances pitch dark. Another court is appropriately known as the Bouman's Gang or the Bogey Man's-court, for there are a dark door and passage out of which dreaded ghosts are supposed to issue. In one court the entrance from the street is only one yard above the causeway, and it is necessary to descend steps from the street to reach the passage. This entrance is shown in the larger photograph to the right of the group of illustrations we publish. From a first-floor window I was able to take a photograph of Blue Rag-court, looking in the direction of the main street. It will be noticed that the court is hemmed in on all sides by houses and that it is badly paved. There are poles outside the windows on which the washed but dripping household linen is hung out to dry and bedding is put out to air. Doubtless, in many instances cholera-infected linen, inefficiently purified by hasty washing, was hung out in this

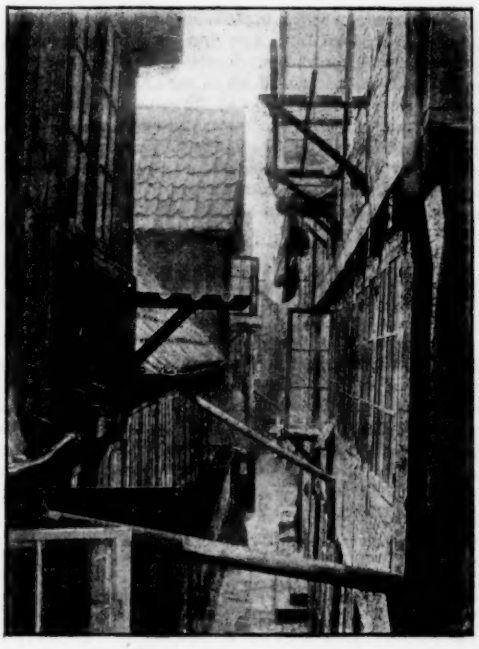
FIG. 1.

"Blue Rag-court," Hamburg.

manner, and drops of foul water sunk in between the pavement below or fell on persons passing to and fro. It is not surprising that cholera, once introduced into such courts, spreads rapidly from house to house. I took another photograph of the view behind, of what is sometimes called the back of Blue Rag-court. This latter is even more confined and more narrow; so narrow, indeed, are some of these courts that boys are able to climb up to the third and fourth floors by simply pressing their hands and feet against the walls on each side of the court. In some instances the very inefficient tin rain-water pipes have been used as soil pipes. In one case I saw the soil coming out of a rent in one of these pipes, and this at the height of a first-floor window. The dilapidated character of these houses, the bulging-out walls, the roofs out of line, all proclaim the antiquity of the buildings; while the soil on which they stand has been saturated for generations with every kind of filth. So narrow are the staircases of the houses that it was quite usual to wrap up the dead bodies in a sheet and lower them out of the windows. Sometimes the undertaker would carry the dead body downstairs on his back. In all cases the coffin could not be brought into the house, and the bodies had to be taken down into the yard to be placed in the coffins. The water-supply—generally only one tap for a whole court, is in the yard, and people came to draw water by the side of the coffins and dead bodies. The rent paid in these courts is frequently not more than £8 a year for two rooms and a lumber room. Such tenements, for the most part, are inhabited by dockers; they are irregular workers of the lowest class. When a ship comes in they may obtain work lasting three days and nights consecutively, and will then earn about £1; but afterwards they are several days without any further employment. Those dockers who have regular employment live in better houses and localities.

On the opposite side of the Schaarmarkt, off a street called the Grosser Backergang, there are other courts and alleys where many poor people died from cholera, and here also are some houses of legalised prostitution. As at Boulogne-sur-Mer, Marseilles and other places, the prostitutes, though living in the thick of the cholera epidemic, were remarkably exempt from the disease. The fact that they do not live in overcrowded houses, that they are not worried with the anxieties poverty

FIG. 2.



Back of "Blue Rag-court," Hamburg.

engenders, have plenty to eat, and are compelled to keep themselves scrupulously clean renders them less susceptible to cholera. Crossing over to another part of the town I found, giving off the broad and straight Steinstrasse and Niederstrasse, many courts and alleys where there had also been a great number of deaths from cholera. The entrance to one of these courts was just sixty-six centimetres wide, but as the walls on either side bulged out here and there it would be no easy matter for a stout man to get through. In this court persons can step out of their windows into the houses opposite. Its entrance is at No. 22 Steinstrasse, and it is certainly the darkest, the most gruesome court I have seen in Hamburg. On the other side of the street there are wider courts, where, nevertheless, an enormous number of deaths occurred; but everywhere there are inevitable swarms of children, overcrowded rooms, poverty and misery, relieved at times by remarkable cleanliness, which constitutes a gratifying surprise in the midst of such squalor. The town of Hamburg will have a hard task to accomplish in clearing away all these rookeries; but by far the worst feature is that there does not seem to be any genuine desire to take

this grievance in hand. There has certainly been some discussion over a project for a Dwelling House Law, in which it will be stated that adults must each have ten cubic metres of space and children five cubic metres in their sleeping rooms; but it is not proposed to organise any means for enforcing such a rule. Action of a much more energetic nature is required than anything implied in this lame project. Hamburg is a beautiful and a prosperous town, but behind its broad streets and its glittering wealth it conceals long, dark, deep courts, where every wretchedness prevails, where epidemics will continue to break out, and where the vivifying touch of sanitary reform is urgently needed. The cause of humanity and indeed enlightened self-interest indicate very clearly that the authorities of Hamburg should no longer defer action of a radical and sweeping character so as to secure the better housing of the poor.

CHOLERA.

BEYOND the intelligence communicated by the Berlin correspondent to the *Standard* there has been no news regarding the progress of cholera in Germany during the week. A fatal case is reported from East Prussia in the person of a youth, the son of a workman. Twelve cases of cholera were reported at Cronstadt, six of which were fatal, on the 30th ult. The *Journal de Bruxelles* of the same date announced that five cases of choleraic disease occurred suddenly at Liège, three being taken to the lazaretto. One fresh case and one death have since been reported. A death from choleraic diarrhœa has been reported at the quarantine station near Stockholm. Cholera has also reappeared at St. Petersburg.

THE METROPOLITAN HOSPITAL SUNDAY FUND.

THE amounts received up to this date by the Metropolitan Hospital Sunday Fund should create a hope that the increase over the sum subscribed last year will be considerable. At present the Fund has received from various sources over £40,000, and the list is not complete. The sum is, however, already greater than that collected last year, while many important additions are still expected. The following figures show the latest amounts received:—

	£	s.	d.
"No Name"	1000	0	0
St. Peter's, Cranley-gardens (Rev. Dr. Ridgway)	351	3	8
Spanish and Portuguese Synagogue (Rev. Dr. Gasta) ...	22	10	1
Stepney Parish Church (Rev. E. Hoskyns)	26	19	7
North Finchley Congregational Church (Rev. Thos. Hill) ...	26	0	0
Clapham Congregational Church (Rev. J. Guiness Rogers)...	36	1	9
Gray's-inn Chapel (Rev. J. H. Lupton)	37	3	4
Christ Church, Hornsey (Rev. C. W. Edmonstone)	60	17	9
Trinity Presbyterian Church, Clapham (Rev. Dr. MacEwan)	22	12	6
All Saints', Kingston-on-Thames (proportion)	20	0	0
St. Augustine's, Honor Oak (Rev. T. White Collard)	26	0	3
St. Mildred's, Lee (Rev. F. W. Helder)	31	12	1
St. Mathias's, Earl's Court (Rev. J. P. F. Davidson) ...	49	18	1
St. Michael and All Angels', Blackheath...	68	9	4
All Saints', Putney Common (Rev. Hon. R. Henley)... ...	24	10	0
Church of the Annunciation, Portman-square (late Quebec Chapel) (Rev. E. B. Ottley)	293	14	6
Crouch-hill Presbyterian Church (Rev. J. B. Mebarry) ...	32	17	10
Waltham Abbey Church (Rev. F. B. Johnstone)	20	16	6
Downs Baptist Chapel, Clapton (Rev. E. Medley)	22	7	7
Holy Innocents, Hornsey (Rev. Tilden Smith)...	32	2	6
Orpington Parish Church (Rev. F. C. Treneh)	66	0	3
St. Mark's, Notting-hill (Rev. W. E. Emmett)	28	13	8
Christ Church, East Greenwich (Rev. G. S. Reany)	34	8	9
St. John's, Notting-hill (Venerable Archdeacon Thornton)	65	10	9
Holloway Chapel of Ease (no Minister)	30	19	0
Wanstead Meeting (J. Lister Godlee, Esq.)	45	14	11
Christ Church, Albany-street (Rev. F. T. Hetling)	26	2	2
St. Margaret's, Lee (Rev. F. H. Law)	47	0	6
St. Michael's, Stockwell (Rev. H. M. Begbie)	27	11	10
St. Andrew's-by-the-Wardrobe, E.C. (Rev. P. Clementi Smith)	36	1	6

MEDICAL MAGISTRATE.—Dr. Frederic Thorne of Leamington has been appointed a Justice of the Peace for the county of Warwick.

Public Health and Poor Law.

LOCAL GOVERNMENT DEPARTMENT.

REPORTS OF MEDICAL OFFICERS OF HEALTH.

Worcester Urban Sanitary District.—Dr. Mabyn Read tells us in his report for 1893 that he has recently drawn up leaflets which are forwarded to midwives who have been in attendance on cases of puerperal fever, setting forth the danger of conveying the disease from one patient to another, and the means of preventing such calamities. The Library and Museum Committee have recently issued some regulations with regard to proceedings to be adopted in reference to public books in houses where infectious disease is present. It is enacted by these regulations that the books shall be at once returned to the librarian at the library, and that notice shall at the same time be given of the existence of the infectious disease. This seems to us rather likely, from a theoretical point of view at any rate, to infect not only the librarian but also the other books: even although the infected books are withdrawn, we are told, from circulation. It would seem on the whole simpler to have the books burnt at the infected house, or at any rate to have them dealt with during the process of disinfection of the premises. The Worcester sanitary authority are to be congratulated on their action in erecting a separate small-pox hospital in an isolated position outside the town, and there also seems a prospect of a new hospital for other infectious diseases being erected. A fatal case of anthrax occurred in Worcester in August, 1893, the victim being a boy aged fourteen, who apparently contracted the disease by playing over bales of horsehair in the store-room. Since March, 1891, six non-fatal cases of anthrax have occurred at the same factory. The first two occurred among the horsehair sorters, and since then the proprietors of the factory have purchased the hair ready sorted. The third occurred in a spinner, and consequently the hair has since been placed in a mixture of hot water and carbolic acid prior to being spun. The fourth case apparently arose from the coverings of the bales, and after this it was determined to remove the coverings in a hot water tank. The order to do this seems, however, to have been disregarded, and the fifth and sixth cases occurred among those who unpacked the bales before placing the hair in water. The manufacturers have now, much to their credit, determined to submit all bales on their arrival to superheated steam in a Washington Lyons disinfecting apparatus. This certainly appears to us to be the only satisfactory method of properly disinfecting the bales, and it is to be hoped that the apparatus will be entrusted to a skilled and conscientious employé who will ensure proper penetration being effected.

Brighton Urban Sanitary District.—Dr. Arthur Newsholme, in discussing the vital statistics of Brighton for 1893, refers to the excessive mortality among illegitimate infants, and points out that an illegitimate child born in Brighton during 1893 had but one-half the prospect of completing its first year of life as a child born in wedlock, and he adds that a large proportion of deaths of illegitimate children are not medically certified. As a check upon the neglect of these unfortunate infants, Dr. Newsholme suggests that each sanitary authority should keep a register of illegitimate children, and that the mother should be compelled at the time of registering the birth with the registrar to place her child's name in the register. Small-pox was introduced into Brighton six times during the year under review, but no secondary cases occurred. In one instance some vagrants who had been exposed to the infection at first refused the proffered revaccination, but it is amusing to note how they at once yielded to a gratuity. Whether this is a legally permissible expenditure of the public funds is a point we must leave the auditor to decide, but obviously it is a much more economical outlay than having to maintain the vagrants when afflicted with small-pox. In connexion with scarlet fever Dr. Newsholme refers to the widespread belief that scarlet fever is not infectious until the appearance of desquamation, and he gives two cases which are apparently illustrative of the infectiousness of the disease even at its onset. In the first case the infection was supposed to have arisen from the vomit of a patient suddenly attacked by the disease, and the second from a handkerchief which had been exposed to infection in a room in which there was a patient in the early stage of the

disease. Dr. Newsholme has done well to quote these cases, as certainly, as he observes, the belief in the non-infectivity of the disease in its early stages is very widespread, and the literature in support of the contrary view very scanty.

Portsmouth Urban Sanitary District.—Dr. Mumby in discussing the immunity of Portsmouth from small-pox points to the fact that the town is fortunate in possessing a very energetic vaccination officer, and it certainly seems by that officer's half-yearly return that he succeeds in carrying out his duties admirably. We notice, however, that in the Landport district out of 1150 births no less than 15 are recorded as "insusceptible." Measles seems to have been very rife in Portsmouth during the year, and 849 cases came to the knowledge of the medical officer of health. Most of these cases were reported by the school attendance officer. In regard to notification Dr. Mumby shows that in Portsmouth the mortality from notified diseases during the ten years notification has been in force has diminished 50 per cent. as compared with the same diseases in the previous ten years, while the non-notifiable diseases have only decreased from 1·78 to 1·74 per 1000; these points are shown well by the subjoined table.

Southampton Urban Sanitary District.—Mr. A. Wellesley Harris states in his annual report that, when any opposition was encountered to the removal of small-pox patients to hospital, inspectors were placed outside the house to warn persons entering or emerging from it that legal proceedings would be taken against them for exposing infected articles. Needless to say that this soon had the desired effect of obtaining the patients' transfer to hospital. Mr. Harris points out in his report that Southampton is exposed in an exceptional degree to the importation of small-pox owing to the fact that the town trades with places where the disease is seldom absent. This being so, it is satisfactory to learn that a port sanitary hospital has now been completed.

Tottenham Urban Sanitary District.—Dr. W. Tyndale Watson states in connexion with the disinfection of infected articles that in cases of small-pox he has reason to believe that infected bedding &c. was removed before the process of disinfection could be completed. We fear that practices such as these are by no means so uncommon as could be wished, and it is certainly likely that some of the secondary cases of infectious disease which occur in houses nominally disinfected are to be thus accounted for.

Table showing the Death-rates of the Seven Principal Zymotic Diseases during the eighteen years 1875–1892, distinguishing between those which are compulsorily notified and those which are not.

Disease.	Before Notification Act.										After Notification Act.									
	1874	1875	1876	1877	1878	1879	1880	1881	1882	1883	1884	1885	1886	1887	1888	1889	1890	1891	1892	1893
Small-pox	0·01	—	—	—	—	—	—	—	—	—	—	—	—	0·02	—	—	—	—	—	—
Scarlet fever	0·30	0·38	3·74	0·29	0·13	0·08	0·06	0·19	0·20	0·11	0·06	0·03	0·12	0·17	0·08	0·07	0·12	0·06	0·11	0·10
Diphtheria	0·16	0·14	0·09	0·04	0·01	0·03	0·14	1·59	0·80	0·14	0·29	0·29	0·45	0·32	0·11	0·21	0·29	0·14	0·16	0·17
Fever	0·85	0·84	0·58	0·71	0·77	0·51	0·49	0·46	0·81	0·69	0·42	0·64	0·86	0·34	0·11	0·20	0·31	0·21	0·27	0·32
Total notifiable diseases	1·32	1·36	4·45	1·07	0·91	0·62	0·69	2·24	1·91	0·94	0·77	0·96	1·43	0·85	0·30	0·48	0·72	0·41	0·54	0·68
Measles	0·47	0·44	0·90	0·09	0·29	0·07	0·29	0·05	1·18	0·07	1·12	0·04	1·37	0·05	0·33	0·05	0·03	1·39	0·23	0·72
Whooping-cough	0·88	0·07	0·34	0·43	0·74	0·07	0·34	0·51	0·27	0·40	0·06	0·31	0·71	0·23	0·17	0·60	0·24	0·24	0·53	0·21
Diarrhœa	1·26	1·15	1·07	1·25	1·37	0·59	1·36	0·56	0·81	0·59	0·85	0·87	1·13	1·03	0·65	0·80	0·67	0·46	0·60	1·47
Total non-notifiable diseases	2·61	1·66	2·31	1·83	2·40	0·73	1·99	1·12	2·26	1·06	2·10	1·22	3·41	1·36	1·15	1·45	0·93	2·09	1·36	2·40
Total zymotic death-rate	3·93	3·02	6·76	2·90	3·31	1·35	2·68	3·46	4·17	2·00	2·87	2·18	4·84	2·21	1·45	1·93	1·65	2·50	1·90	3·08

Average death rate from notifiable diseases for ten years before the adoption of notification .... 1·54 per 1000.
" " " " after " .... 0·71 "
" non-notifiable " before " .... 1·78 "
" " " after " .... 1·74 "
Average deaths from the seven principal zymotic diseases for ten years before " .... 3·35 "
" " " " after " .... 2·45 "

VITAL STATISTICS.

HEALTH OF ENGLISH TOWNS.

In thirty-three of the largest English towns 6009 births and 3101 deaths were registered during the week ending June 30th. The annual rate of mortality in these towns, which had declined in the preceding five weeks from 17·7 to 15·7 per 1000, further fell last week to 15·5. In London the rate was 15·4 per 1000, while it averaged 15·5 in the thirty-two provincial towns. The lowest rates in these towns were 7·0 in Croydon, 10·2 in Leicester, 10·4 in Swansea, 10·5 in Brighton, and 11·1 in Derby; the highest rates were 18·0 in Sunderland, 19·8 in Bolton, 20·0 in Manchester, 22·3 in Liverpool, and 24·1 in Salford. The 3101 deaths included 433 which were referred to the principal zymotic diseases, against 441 and 445 in the preceding two weeks; of these, 163 resulted from measles, 75 from whooping-cough, 74 from diphtheria, 44 from scarlet fever, 44 from diarrhœa, 26 from "fever" (principally enteric), and 7 from small-pox. No fatal case of any of these diseases was recorded last week in Derby; in the other towns they caused the lowest death-rates in Bradford, Bolton, and Birkenhead, and the highest rates in Bristol, Wolverhampton, Liverpool, and Salford. The greatest mortality from measles occurred in Nottingham, Bristol, Liverpool, West Ham, Salford, and Sunderland; from scarlet fever in Wolverhampton; and from whooping-cough in Newcastle-upon-Tyne, Bristol, Nottingham, and Salford. The mortality from "fever" showed no marked excess in any of the large towns. The 74 deaths from diphtheria included 56 in London, and 2 each in Manchester, Oldham, Leeds, Sheffield, and Gateshead. Three fatal cases of small-pox were registered in Birmingham, 2 in Manchester, 1 in West Ham, and 1 in Preston, but not one in London or in any other of the thirty-three large towns. There were 132 cases of small-pox under treatment in the Metropolitan Asylum Hospitals and in the Highgate Small-pox Hospital on Saturday last, June 30th, against 227, 204, and 170 at the end of the preceding three weeks; 16 new cases were admitted during the week, against 42, 40, and 21 in the preceding three weeks. The number of scarlet fever patients in the Metropolitan Asylum Hospitals and in the London Fever Hospital at the end of the week was 2087, against 2232, 2190, and 2153 on the preceding three Saturdays; 233 new cases were admitted during the week, against 238 and 231 in the preceding two weeks. The deaths referred to diseases of the respiratory organs in London, which had been 184 and 201 in the preceding two weeks, declined again last week to 152, and were 60 below the corrected average. The causes of 38, or 1·2 per cent., of the deaths in the thirty-three towns were not certified, either by a registered medical practitioner or by a coroner. All the causes of death were duly certified in Portsmouth, Bristol, Leicester, Nottingham, Bradford, and in thirteen other smaller towns; the largest proportions of uncertified deaths were registered in Birmingham, Leeds, and Sheffield.

HEALTH OF SCOTCH TOWNS.

The annual rate of mortality in the eight Scotch towns, which had declined in the preceding four weeks from 20·3 to 16·6 per 1000, rose again to 16·9 during the week ending June 30th, and exceeded by 1·4 per 1000 the mean rate during the same period in the thirty-three large English towns. The rates in the eight Scotch towns ranged from 13·1 in Edinburgh and 14·4 in Leith to 20·0 in Dundee and 22·1 in Aberdeen. The 481 deaths in these towns included 20 which were referred to whooping-cough, 11 to diarrhœa, 10

to scarlet fever, 8 to measles, 7 to diphtheria, 3 to small-pox, and 2 to "fever." In all, 61 deaths resulted from these principal zymotic diseases, against 62 and 58 in the preceding two weeks. These 61 deaths were equal to an annual rate of 2·1 per 1000, which was slightly below the mean rate last week from the same diseases in the thirty-three large English towns. The fatal cases of whooping-cough, which had been 22 and 18 in the preceding two weeks, rose again to 20 last week, of which 9 occurred in Glasgow and 5 in Aberdeen. The deaths referred to scarlet fever, which had been 3 and 7 in the preceding two weeks, further rose to 10 last week, and included 6 in Glasgow and 3 in Aberdeen. The 8 fatal cases of measles slightly exceeded the number in the preceding week, and included 4 in Glasgow and 3 in Dundee. The deaths from diphtheria, which had been 7 and 6 in the preceding two weeks, were 7 last week, of which 3 occurred in Glasgow and 3 in Edinburgh. The 3 fatal cases of small-pox, were recorded in Leith and the 2 deaths from "fever" in Glasgow. The deaths referred to diseases of the respiratory organs in these towns, which had been 91 and 66 in the preceding two weeks, rose again to 81 last week, but were 8 below the number in the corresponding period of last year. The causes of 22, or nearly 5 per cent., of the deaths in the eight towns last week were not certified.

HEALTH OF DUBLIN.

The death-rate in Dublin, which had been 24·6 and 23·1 per 1000 in the preceding two weeks, further declined to 20·3 during the week ending June 30th. During the thirteen weeks of the quarter ending on Saturday last the death-rate in the city averaged 23·4 per 1000, against 17·4 in London and 17·1 in Edinburgh. The 136 deaths registered in Dublin during the week under notice showed a decline of 19 from the number in the previous week, and included 10 which were referred to the principal zymotic diseases, against 12 and 9 in the preceding two weeks; of these, 4 resulted from "fever" (principally enteric), 2 from whooping-cough, 2 from scarlet fever, 1 from measles, 1 from diarrhœa, and not one either from small-pox or diphtheria. These 10 deaths were equal to an annual rate of 1·5 per 1000, the zymotic death-rate during the same period being 2·6 in London and 0·6 in Edinburgh. The deaths referred to different forms of "fever," which had been 1 and 4 in the preceding two weeks, were again 4 last week. The fatal cases of whooping-cough, which had been 7 and 3 in the preceding two weeks, further declined to 2 last week. The 2 deaths referred to scarlet fever exceeded the number recorded in any week since April last. The 136 deaths in Dublin last week included 24 of infants under one year of age, and 27 of persons aged upwards of sixty years; the deaths both of infants and of elderly persons were below the numbers returned in recent weeks. Two inquest cases and 3 deaths from violence were registered; and 57, or more than a third, of the deaths occurred in public institutions. The causes of 11, or more than 8 per cent., of the deaths in the city last week were not certified.

THE SERVICES.

MOVEMENTS OF THE MEDICAL STAFF.

SURGEON-CAPTAIN D. BRUCE has embarked in H.M.S. *Tamar* for conveyance to South Africa.

THE ARMY MEDICAL STAFF AND ARMY SERVICE CORPS.

Referring to the special training of the Army Medical Staff and the Medical Staff Corps, at Aldershot and the Curragh, in field work, the *Medical Magazine* says: "It is undoubtedly a step in the right direction. ..... There are two ways, and two ways only, of dealing with the question of medical aid in war: (1) warfare, as a remnant of savagism, should be carried out on purely savage lines, sick and wounded being left to take their chance without help from the State; and (2) if the spirit of the age will not allow the acceptation of this common-sense view of the matter, the humanitarian methods adopted must be as perfect as possible No half or quarter measures are permissible; the illogicality of the procedure must be redeemed by its completeness—otherwise no condemnation could be too strong. The Medical Staff Corps, if it is to exist at all, should be self-contained and self-sufficing. It should possess its own transport, and be in this respect entirely independent of the Army Service Corps. A system that depends for its efficiency on the coöperation of men and animals already fully charged with onerous duties can never stand the test of active service."

INDIA AND THE INDIAN MEDICAL SERVICE.

The following appointments are announced:—Surgeon-Captain B. C. Oldham, to do general duty at the Presidency until further orders. Surgeon-Captain E. H. Brown, Officiating Civil Surgeon of the 24th Parganas, to act as Deputy Sanitary Commissioner, Metropolitan and Eastern Bengal Circle, until further orders. Surgeon-Captain E. Jennings to act as Civil Surgeon of Rangpur. Brigade-Surgeon-Lieutenant-Colonel G. Bainbridge, M.D., to act as Deputy Sanitary Commissioner, Sind Registration District, in addition to his own duties. Surgeon-Major G. M. J. Giles, Officiating Deputy Sanitary Commissioner, 3rd Circle, to officiate as a Civil Surgeon, 2nd class, and to be posted to the Medical Charge of the Bijnor district. Surgeon-Captain R. Robertson is appointed to be District Surgeon and Superintendent of Gaol, Bellary, sub *pro tem.*, during the employment of Surgeon-Major W. O'Hara on other duty, but to continue to act as District Surgeon, Coimbatore. Surgeon-Colonel Warburton is confirmed in his appointment as Principal Medical Officer and Sanitary Commissioner of Assam. Surgeon-Major Robertson on arrival in India, after visiting Simla, will start for Gilgit, to take over the duties of British Agent there. The Queen's approval to the following promotions among officers of the Indian Medical Service appears in the *London Gazette* of June 22nd:—*Bengal Medical Establishment:* To be Surgeon-Colonel: Brigade-Surgeon-Lieutenant-Colonel Daniel O'Connell Raye, M.D. Surgeon-Majors to be Surgeon-Lieutenant-Colonels: Samuel Haslett Browne, M.D.; Edward Mair; James Armstrong; Horace Parr Yeld; John Campbell Fullerton; Charles James Hislop Warden. Surgeon-Captains to be Surgeon-Majors: Richard Havelock Charles, M.D.; George Duncan; William Ainley Sykes, D.S.O. *Madras Medical Establishment:* Surgeon-Majors to be Surgeon-Lieutenant-Colonels: Percy Hugh Benson; John Lancaster; Walter Gawen King. Surgeon-Captains to be Surgeon-Majors: Edwin William Reilly; James Scott. *Bombay Medical Establishment:* Surgeon-Majors to be Surgeon-Lieutenant-Colonels: James Sutherland Wilkins, D.S.O.; William Alexander Barren. Surgeon-Captains to be Surgeon-Majors: Robert William Steele Lyons, M.D.; John Patrick Barry Alexander Vass Anderson. Her Majesty has also approved of the retirement of the following officers:—*Bengal Medical Establishment:* Surgeon-Colonel Edward Ord Tandy; Brigade-Surgeon-Lieutenant-Colonel Denis Francis Keegan, M.D. *Bombay Medical Establishment:* Brigade-Surgeon-Lieutenant-Colonel Joseph Forbes Keith, M.D. Surgeon-Lieutenant-Colonel Francis Cobham Nicholson, M.B., and Surgeon-Lieutenant-Colonel S. M. Salaman, M.D., I.M.S., are promoted to Brigade-Surgeon-Lieutenant-Colonels.

VOLUNTEER OFFICERS' DECORATION.

The Queen has conferred the Volunteer Officers' Decoration upon the undermentioned Officers of the Volunteer Force:—*North-Eastern District: Engineer:* 1st Newcastle-on-Tyne: Surgeon-Lieutenant-Colonel Robert F. Cook, M.B.—*South-Eastern District: Rifle:* 2nd (the Weald of Kent) Volunteer Battalion, the Buffs (East Kent Regiment): Surgeon-Lieutenant-Colonel Thomas Joyce.

DEATHS IN THE SERVICES.

Deputy-Inspector-General George Frederick Augustus Drew, R.N., died on June 22nd at Highfield, Hartley, Plymouth, aged sixty-six. He became surgeon in 1851, staff-surgeon in 1855, fleet-surgeon in 1873, and was placed on the Retired List in 1882.

THE LATE BRIGADE-SURGEON G. C. GRIBBON.

The Army Medical Staff and a large circle of friends must have read the announcement in our columns of the death of this officer, on the 12th ult., at Bournemouth, with sincere regret. Brigade-Surgeon Gribbon was well known and most deservedly popular and respected; he was a man of superior ability and literary attainments, an excellent officer with large knowledge of his profession, and the possessor of a sound judgment, as well as being a most genial and pleasant companion. He served for a long time in the 25th King's Own Borderers Regiment. He became Assistant Surgeon in 1859, Surgeon in 1873, Surgeon-Major in 1874, Brigade-Surgeon in 1885, and was placed on the Retired List in 1889. He served in the Afghan War in 1878-79, and also in the Soudan campaign in 1885, being mentioned

in despatches. The late officer held the London recruiting appointment for some time before his death, which was a remote consequence of an attack of influenza and acute pulmonary disease.

The *Broad Arrow* says: "A number of Crimean Army doctors who rendered good services in the campaign of 1854–55 have recently passed away. Deputy-Surgeon-General St. John Stanley, who died on May 4th, was with the 17th Lancers at Alma, Inkerman, and before Sebastopol, as was Deputy-Inspector-General De Lisle, whose war services were passed with the 4th King's Own. Deputy-Inspector-General Henry Downes was a staff assistant-surgeon at the siege and fall of Sebastopol, and Surgeon-Major Thomas Park was with the Royal Artillery at Inkerman and throughout the great siege. Both Drs. De Lisle and Park were decorated with the cross of the Legion of Honour."

THE SOLDIER'S RATION.

It is said that the food of the soldier has been the subject of much discussion in Berlin lately and that the German Medical Staff has been carrying out some important practical experiments in order to discover what food is best suited to the soldier under the varied conditions of military life. Our service contemporary, the *Army and Navy Gazette*, states that the tests applied have been of a rigorous and exact kind and have extended over some period of time. The individual subjects of the experimental trials have been supplied with rations of different kinds and amounts whilst undertaking marches and field practices with the German troops and attending at the hospital from day to day in order that their health and physical condition should be accurately determined and registered. The publication of the results of these experiments is awaited with interest. The soldier's physical efficiency on service mainly turns on a question of feeding and fatigue—the more laborious the work the greater the need for feeding. The first thing that strikes us is that on field service provision should be made for meeting the two different conditions of a comparatively sedentary army and an actively marching fighting force by creating two separate scales of field ration, the one for ordinary use, the other and larger one for extraordinary occasions; and it should not be difficult to accomplish this by simply making an addition in certain respects to the daily field ration ordinarily issued. Assuming that an army has sufficient shelter, is properly clad, and is not broken down by hard and harassing work, the maintenance of its health and vigour becomes, after all, mainly a question of feeding. More work and energy cannot be got out of a man than are first of all put into him in the way of food. In the case of forced marches and special services, especially where transport is a difficulty, as it so frequently is in warfare, soldiers must have recourse to tinned meats and to various artificial food preparations. If only reliance could be placed on the assurances of contractors and advertisers there would be no difficulty in supplying an expedition with stores of energy in the shape of portable foods, essences, compressed rations, and so forth, whereas in actual practice there is nothing much harder. The nutritive value of such things is invariably below their advertised or alleged value, and commonly below their chemical value as decided by the results of chemical analysis. However much meat may be concentrated it cannot theoretically be reduced below one-fourth of its natural weight, whilst practically from one-third to three-tenths would be about the real limit. Men are something more than crucibles or mere machines, and the form as well as the exact chemical value of the food has to be considered; it has to be varied and palatable, and suitable to all the conditions and circumstances present at the time.

THE PREVALENCE OF FEVER IN THE FLEET AT MALTA.

We called attention to this subject last week, and alluded to its probable connexion with the local condition of the harbours at Valetta. The Mediterranean is tideless, and these harbours have narrow entrances and are to a great extent land-locked and have no rivers opening into them; consequently the town sewage, which debouches into the harbours, has little or no chance of passing out, to say nothing of the refuse and sewage derived from the shipping itself. The natural result of this condition of things is that the harbour and creeks get fouled with stagnant sewage, and with each recurring hot season fever is the consequence. That this is so appears to be corroborated by the fact that there is an undue amount of fever among the crews of the warships afloat, as compared with that among the garrison on shore. The unhealthiness of the Malta harbours is no new thing. Outbreaks of fever have frequently occurred in the ships at this station. The subject calls for investigation and remedy, and until something is done the sensible course, as it seems to us, would be for the fleet to be sent to sea for a cruise, instead of remaining inside the harbour. Although fevers of one kind and another have made their appearance for many years among the troops at Malta, the improved state of the drainage is credited with having had a beneficial effect on the general health, but nothing has been done to overcome the insanitary state of the harbour, especially noticeable when the weather is hot and the sea a dead calm.

Correspondence.

"Audi alteram partem."

AN INTERNATIONAL MONUMENT TO CHARCOT.

To the Editors of THE LANCET.

SIRS,—I am glad to see that a movement has been set on foot in Germany to raise funds to assist in the erection of a monument to Charcot in the Salpêtrière. May I suggest that a similar committee should be formed in England, so that we may join in this tribute to the memory of the great man who bore so large a part of the burden in the early days of the advance of neurology, and to whom more than to any other man we owe the great success that has attended that movement.—I am, Sirs, yours faithfully,

Edmund-st., Birmingham, July 3rd, 1894. ROBERT SAUNDBY.

"THE ACTION OF ASPARAGUS ON THE KIDNEYS."

To the Editors of THE LANCET.

SIRS,—Now the asparagus season is nearly over I am frequently asked what is the final result of my observations and experience as to the question of its action on the kidney. Will you, therefore, spare me once more a few lines to say I am completely convinced of the accuracy of the statement I made three years ago in your journal—that asparagus is not a diuretic, but has an opposite inhibitory action on the function of the kidney. Dr. Burney Yeo replies that he has no right to object to such evidence as I have brought forward for the basis of my own belief, but he considers it quite inadequate to upset the opposite opinion, to which he still adheres. I will therefore state my proposition and experience once more, upon which every one has a right to form his own conclusion. It is said that if anyone partakes of asparagus it acts as a diuretic—that is, in common language, after eating it he passes more urine. This it is which I deny, and maintain, on the other hand, that after partaking of a good plateful of this vegetable—say twenty or thirty points—he passes less urine. Most of my informants say that on going to bed the amount is often only a third of that which is usually passed. When more than twenty educated and reliable persons, most of them medical men, tell me this I accept their statement, and I naturally form the conclusion that asparagus arrests the action of the kidney. The question to be solved appears to me to be one of remarkable simplicity. Does a person after eating a good plateful of asparagus pass more urine or less? At present all the evidence which I can obtain is entirely on one side. As before said, I have no especial interest in the subject except in a very general sense, that it affords an example of numerous other accepted statements with regard to the effects of articles of diet and of drugs which are equally fallacious and require correction. I might add that my correspondence contains opinions as to the ill-effects of asparagus in gout; two writers also speak of the scalding and irritability produced by the concentrated urine, and another of the good effects of the vegetable in a case of muco-purulent urine with frequency of micturition. All these

statements are too crude for me at present to consider, suffice it to say that asparagus is not a diuretic.

I am, Sirs, your obedient servant,

Grosvenor-street, June, 1894. SAMUEL WILKS.

PRIMARY SARCOMA OF THE SYNOVIAL MEMBRANE.

To the Editors of THE LANCET.

SIRS,—In THE LANCET of June 30th there is reported a case of "sarcomatous degeneration of the synovial membrane of the knee-joint" under the care of Mr. Hardie in the Manchester Royal Infirmary. In the account that is given of the case it is stated that a primary growth of a sarcomatous nature in the synovial membrane is practically unknown, and further information upon this subject is asked for. I would like to lay before your readers the notes of one other case of a similar condition, which was under the care of Professor Annandale in the Edinburgh Royal Infirmary in February, 1886, and which was referred to by him in a paper on "Internal Derangements of the Knee-Joint" read before the Medico-Chirurgical Society of Edinburgh in the same year. The patient was a woman aged thirty-three who began to suffer from occasional pain in her right knee-joint eighteen months before her admission; at times the movements of the joint were interfered with. When examined a movable body could be detected upon the outer site of the joint near the site of the external semilunar cartilage, and the body could be made to disappear on pressing. The joint was opened over the position of this swelling, and there was found attached to the synovial membrane a small tumour the size of a horse-bean. Its neck was ligatured with catgut, the growth removed, and the joint closed. The wound healed well, and the patient (whom I had an opportunity of seeing in April of this year) was perfectly well and experienced no trouble from her knee. The growth was examined by Dr. Sims Woodhead, who pronounced it to be an example of myeloid sarcoma. In reference to this subject I would draw attention to an interesting paper by Dr. Weir in the *New York Medical Record* of June 21st, 1886, upon "Fatty and Sarcomatous Tumours of the Knee-Joint," where two cases evidently of a similar nature to the one I have reported are described.

I am, Sirs, yours faithfully,

A. LOGAN TURNER, M.B., F.R.C.S. Edin.

Edinburgh, July 2nd, 1894.

ARE SHIPS' SURGEONS AFLOAT SANITARY OFFICERS?

To the Editors of THE LANCET.

SIRS,—As so many medical officers of the mercantile marine are subscribers to THE LANCET will you allow me to draw their attention to the Congress of the Sanitary Institute, to be held at Liverpool in September, when there will be a special conference dealing with the sanitation of the passenger and mercantile marine service, to be presided over by Sir William Forwood. I am preparing a paper to read upon the subject and shall be glad to embody any facts in proof that the ships' surgeon of to-day has not any recognised position on shipboard afloat in the mercantile navy, and therefore the urgent need of conferring upon him special powers analogous to those of medical officer of health on land, and that there should be a medical adviser at headquarters, Marine Department Board of Trade, through whom the ships' surgeon would have protection in all sanitary questions affecting the health and comfort of passengers and crew under his medical charge.

I am, Sirs, yours faithfully,

Seaforth, Liverpool, June, 18th, 1894. C. H. LEET, F.R.C.S.

TIC DOULOUREUX AND ELECTRICITY.

To the Editors of THE LANCET.

SIRS,—The result of the use of the "hydro-electric dipolar bath" in a severe case of trigeminal neuralgia certainly seems to have been magnificent in Dr. Hedley's hands,[1] but the apparatus required for such a treatment is out of reach of most practitioners. It may, therefore, be useful to state that a much longer application of the continuous current, used in the ordinary way by moistened electrodes, than was resorted to in the case alluded to, would probably have had the same effect. To apply the current in cases of severe tic douloureux for five minutes only, as was done by Dr. Hedley, can only be exceptionally useful. For a number of years past I have been in the habit of commencing the treatment in such cases with an application continued for at least thirty minutes, and have occasionally prolonged it for an hour. The result of a single such long application is generally most satisfactory, but the treatment has habitually to be continued daily for two or three weeks before the patient is thoroughly relieved. In order to avoid blistering the skin by such long applications it is advisable to use a very gentle force, say one milliampère. In one case, in which there was extreme sensitiveness to electricity, I have successfully used a current of 0·60 milliampère only. I generally apply the anode to the painful part, but in one most obstinate case I found it more effective to reverse the direction of the current in the metallic circuit every five minutes.

I am, Sirs, yours faithfully.

Harley-street, June 30th, 1894. JULIUS ALTHAUS, M.D.

[1] THE LANCET, June 23rd, 1894.

HALLUX RIGIDUS.

To the Editors of THE LANCET.

SIRS,—Foot-physiology, for the study of which I have lately been pleading in your columns, has important bearings on the surgical condition described by Mr. Mayo Collier in THE LANCET of last week. If the great toe be packed in the medium-pointed boot somewhat over the second, this accords with the natural position of rest, and there may be no great interference with its natural plane of movement, downwards and inwards. If, however, it be packed under the second toe, then, so far as it moves at all, it acts on the metatarso-phalangeal joint as on a hinge grinding from uneven pressure, hence the erosion of cartilage. The pain leads to instinctive effort to hold the toe fixed, hence the rigidity. The second toe holds down the great toe, hence the depression of the first phalanx. The whole foot is not used as a foot, but rather as an inanimate block, hence the coldness, want of tone, and "impaired nutrition." The bow-string or tie-rod influence of the long flexor on the plantar arch is lost, hence the associated flat foot.

Mr. Collier does not state whether, in his unsuccessful treatment before operation, he added to "so-termed appropriate boots" proper stockings. I find it very difficult to get patients or surgeons to recognise the importance of this point. The ordinary medium-pointed stocking, with the friction against the side of the boot in putting on the latter, has the effect of drawing the toes into the form of a cone, and so fixing them in a vicious position that the crippled great toe cannot escape.

I am, Sirs, yours faithfully,

Gloucester, July 2nd, 1894. T. S. ELLIS.

"THE MALIGNANT TRANSFORMATION OF BENIGN LARYNGEAL TUMOURS AS A CONSEQUENCE OF ENDO-LARYNGEAL OPERATIONS."

To the Editors of THE LANCET.

SIRS,—I have seen in the columns of THE LANCET what Mr. Lennox Browne calls a rejoinder to my letter of June 16th. Mr. Browne has carefully evaded the ethical point. You published for me a protest against an unwarrantable perversion of my plain words. While admitting this perversion, Mr. Browne goes on to defend his position, instead of apologising for what really appears to be a lamentable breach of literary good faith. He then makes bold to appeal to you and to your readers for an answer to the question whether the substitution of one word for another is justifiable. In reference to the quotation he states that my exact words are used. This was not so. My plain statement was altered in a most unjustifiable manner. Now, Sirs, the one point in which I am in accord with Mr. Browne is that I also should like to have your opinion on this simple question at issue. I do not care to follow Mr. Browne into the flood of words by means of which he obscures the real point at issue. What I wish to know is this, Are medical ethics merely theoretical, or is there a moral obligation on the part of

every member of the profession to truly render the exact meaning of the unambiguous words of other writers? On account of the delay which took place in the publication of my letter of May 14th (a delay which I can quite understand) I sent a copy of it to the editors of the *Glasgow Medical Journal*, and they, after publishing it and Mr. Lennox Browne's rejoinder, appended the note which follows on this letter. Although a reply has already been given with regard to this controversy by the editors of the *Glasgow Medical Journal*, I consider it most desirable that the Editors of THE LANCET also should express their opinion on this question of ethics. It is not to me a personal matter. What I want to do is to vindicate professional ethics as applied to such cases.

I am, Sirs, yours faithfully,

July 3rd, 1894. DAVID NEWMAN.

Editorial Note in the "Glasgow Medical Journal."

"We publish Mr. Lennox Browne's letter, but must at the same time express regret at its tone and method. Dr. Newman pointed out that Mr. Browne, in what he cites as an *exact* quotation, alters an important word, thereby changing the meaning entirely. Mr. Browne does not deny altering the word, and we are convinced that his contention that he has not altered the meaning is not made good. When an author who is citing a case as cancerous from the onset states that at one period he believed it to be innocent, it is altering his meaning entirely to substitute "demonstrated" for "believed," and to make it appear that he still believes it to be innocent at the time of the first examination. Mr. Browne's further claim that Dr. Newman was at one time an adherent of the opinion that such innocent growths may by surgical interference be transformed into malignant tumours, seems to us to be equally devoid of foundation. The passages quoted by Mr. Browne from Dr. Newman's writings show that the latter believes in the transformation of innocent into malignant growths, but we have not discovered a single word favouring the idea that he ever believed that instrumental interference is an element in producing such transformation. The long quotations in which Mr. Browne indulges are thus entirely wide of the mark and do not bear out his contention. We have made these remarks without consulting Dr. Newman, and simply to bring back the reader to the points in dispute, which Mr. Browne obscures in a cloud of words. EDITORS *G.M.J.*"

Glasgow Medical Journal, July, 1894.

THE WEEKLY HEALTH RETURNS OF MANCHESTER.

To the Editors of THE LANCET.

SIRS,—Will you kindly allow me to say that the Manchester weekly return, of which you speak so highly, and with justice, at p. 1635 of THE LANCET of June 30th, was not drawn up by me, but by the former medical officer of health for Manchester, Dr. Tatham, now chief of the Statistical Department, Somerset House. I am, Sirs, yours faithfully,

City of Manchester Town Hall, June 29th, 1894. JAMES NIVEN.

MANCHESTER.

(FROM OUR OWN CORRESPONDENT.)

Small-pox.

SMALL-POX still threatens seriously, thirty-five cases, with one death, having occurred last week. All the cases were removed to hospital. Measures have been taken to provide for any further spread of the disease by increasing the number of beds very considerably at the Clayton Vale Hospital. Existing buildings, part of extensive disused manufacturing premises, are fortunately well adapted for hospital wards. It is intended to send acute cases there at once, the danger from aerial infection being less than at Monsall, where the small-pox wards, though as far from the other portions of the hospital as they could be placed, are nearer than is desirable.

Stockport.

The annual meeting of the Lancashire and Cheshire branch of the British Medical Association was held at Stockport on June 27th, under the presidency of Dr. Edwin Rayner. It was very numerously attended, probably more than 400 members being present. The scientific pabulum on the agenda paper was small in quantity, though no doubt good of its kind; but the quality could not be tested, as this portion of the business was not reached. The attraction drawing so many together was, no doubt, the great midwife question, which seems to have a marvellously stimulating effect even on the most phlegmatic temperaments.

Refuse Destructor for Moss Side.

The ratepayers and property owners of Moss Side, a southern suburb of Manchester, have been much exercised in mind on account of the intention of the local board to erect a "destructor" for the district. A deputation attended at the last monthly meeting to urge that nothing should be done till after the November election. All sorts of exaggerated fears found expression—that if carried out the scheme would be disastrous to the future of the district; that "the nuisance caused by the constant passing of night-soil carts, joined to that of the destructor, was likely to cause an injury to property and to Whitworth Park which could not be exaggerated." It was explained that the construction provided for the burning of all noxious fumes or gases, so that they could not escape unconsumed; "that no excreta would be dealt with at the destructor, but that they would be taken direct to farms"; that there would only be thirty loads for twenty-four hours over the whole district, &c. The inhabitants of each district always wish to pass on their refuse to the next, and think it a hardship that it is not allowed; but by degrees it may be hoped that less selfish and more equitable views will be entertained.

Carriage of Meat through the Streets.

A letter in one of the local papers draws attention to the revolting and barbarous fashion in which meat is conveyed through the streets of most of our towns from the slaughter-houses. The same applies to imported frozen meat. "It is quite customary for carts or traps to be loaded with meat exposed to dust, rain, and sun, except for a partial covering of apparently old sacking, and frequently I have noticed the driver and a friend or two seated upon the meat, evidently preferring it to a harder substance." This is a perfectly truthful picture, and the writer's suggestion that covered conveyances should be used is one the authorities might take up, if only for decency's sake.

July 4th.

NORTHERN COUNTIES NOTES.

(FROM OUR OWN CORRESPONDENT.)

Railway Servants' Eyesight Test: an Important Modification.

THE general manager of the North-Eastern Railway Company has, it is stated, considerably modified the eyesight test which certain employés of the company have recently had to undergo, and which appears to have given rise to much dissatisfaction among the men. With regard to the wool test, the candidate is not to be deemed "colour blind" if he is able to properly distinguish green from red, or red from green, and the standard of normal form vision (Snellen's type test) is 6·6; whilst the cases of those who are as low as 6·18 will be specially considered.

Memorial to Miss Mary Burton.

The Bishop of Carlisle has dedicated a chapel which has been erected at the Border Counties Home for Incurables, Carlisle, as a memorial of the late Miss Mary Burton, who practically initiated the scheme for the founding of the home, and whose sisters at the present time are among the most active and valued supporters of the home, which contains some twenty-six inmates. The chapel has cost about £500.

Poisoned with White Lead.

An inquest has been held at the Gateshead workhouse into the cause of the death of Sarah Ann Cairns, aged thirty-three, who died at that institution on the 17th ult. The deceased had been employed at the white lead works at Ouseburn since March this year. She came home ill on the 7th ult. and was removed to the union workhouse on the 11th ult. She was then attended by Dr. Cook, but died six days later. A verdict was returned to the effect that death was due to convulsions consequent upon lead poisoning.

Home for Destitute Crippled Children.

The committee of the Home for Destitute Crippled Children at a meeting held yesterday completed the purchase from the

Gosforth Park Estate Company of two acres of land on which they hope, at an early date, to commence erecting a more commodious and convenient building than that which they at present possess. The purchase money was £1300.

Coxlodge Asylum.

A commencement has been made with the enlargement of the Newcastle City Lunatic Asylum at Coxlodge. When the extension has been completed, the accommodation at the asylum will be doubled, and the establishment will be relieved from the pressure that has been experienced for so long a time. This pressure was so great a short time ago that the committee were obliged not only to buy an iron church and have it fixed on the ground for the reception of patients, but the chapel in the building had to be requisitioned for dormitory purposes. It is regrettable that so much accommodation should be required for such a purpose, but it is stated to be due almost entirely to the rapidity of the growth of the population. Allowing for this increase, it is believed that the proportion of lunatics to inhabitants is lower in Newcastle than in many other large cities and towns. The work at present in progress in connexion with the enlargement consists in the formation of the foundations. The cost of the foundations alone is estimated at from £9000 to £10,000, while the total cost of the new building will not run far short of from £80,000 to £100,000.

The Treatment of the Insane.

Dr. Campbell says that in the Cumberland and Westmorland Lunatic Asylum the recovery rate has been 39 per cent. on the admissions during the ten years ending 1872, 47·3 per cent. in the ten years ending 1882, and 41·1 per cent. in the ten years ending 1892.

The epidemic of measles at Sunderland continues to be of a mild type. Only three fatal cases were reported last week out of over 700 which have been notified to the health authorities up to the present time.

Newcastle-on-Tyne, July 4th.

SCOTLAND.

(FROM OUR OWN CORRESPONDENT.)

Small-pox in Edinburgh.

AT the meeting of the town council of Edinburgh last week considerable discussion took place regarding the site of the small-pox hospital, the convener of the Public Health Committee being questioned as to the reason for setting a small-pox hospital or quarantine station in such a densely populated locality as the Cowgate. It was intimated that permission had been obtained from the Board of Works to erect a hospital in the Queen's Park, and that as soon as it was ready all small-pox cases would be sent there. It was hoped, however, that, although accommodation was being provided, the epidemic had passed its worst, for there were ten fewer patients in hospital than there were a week before.

The Leith Sanitary Authorities.

Immediately in the wake of the trouble with the town council of Leith and the small-pox epidemic there has arisen a feud between the sanitary officials. The feud began by the medical officer of health making charges against the sanitary inspector. These were remitted to a committee for investigation, and necessarily much of what takes place is finding its way into the newspapers. With reference to the statements and denials, charges and counter-charges, it is not my business to deal, but it may be pointed out that this is simply an example of what may occur in any sanitary district owing to the position in which public health officials at present stand to one another. The sanitary inspector is quite independent of the medical officer of health, and the Board of Supervision has not seen its way to recognise that he is under the medical officer of health. This has led to considerable friction, which is not generally known or heard of, but it none the less exists, and matters will not be right until the medical officer is clearly and unambiguously head of his own department with the sanitary inspector under his direction and authority.

Forfarshire Medical Association.

The thirty-sixth annual general meeting of the Forfarshire Medical Association was held in the White Hart Hotel, Arbroath, on Thursday, June 28th, Dr. Russell, Arbroath, President, in the chair. The members present included Drs. Russell, Dewar, Laing, Peters, and T. F. Dewar, Arbroath; Drs. MacEwan, A. M. Anderson, Duncan, Raw, McGillivray, and Mr. Peter Campbell, Dundee; Drs. Lawrence, Key, Havelock, and Mr. Gunning, Montrose; Drs. McLagan Wedderburn and Mr. Cable, Forfar; Dr. Rorie, Dundee Royal Asylum; and Dr. Durran, Kirriemuir. Professors Ogston and Finlay, Aberdeen, and Staff-Surgeon Pearson, R.N., were present as guests. The yearly financial statement was considered satisfactory, and Dr. J. W. Miller was appointed auditor of accounts for the current year.—On the motion of Dr. MacEwan, seconded by Dr. Lawrence, it was agreed to give a donation of three guineas to the British Medical Benevolent Fund.—Dr. Key proposed that the meeting for 1895 should be held in Forfar, and that the following gentlemen should be appointed office-bearers for the current year: President, Mr. Alexander (Forfar); Vice-Presidents, Dr. A. K. Mill (Kirriemuir) and Dr. A. M. Stalker (Dundee); Council, Drs. Charles Moon, J. W. Miller, Sinclair, Buist, Lennox, and Mackie Whyte; hon. treasurer, Dr. McGillivray, 13, Airlie-place, Dundee; hon. secretary, Mr. Peter Campbell, 29, Springfield, Dundee.—The President (Mr. Russell) then read a paper on the Evil Effects of Over-pressure in Schools, Colleges, and in the Ordinary Business of Life.—After the business meeting the members dined together in the large hall of the hotel, under the chairmanship of Dr. Russell.

The Death-rate in the Eight Principal Towns.

The death-rate in the eight principal towns during the week ending Saturday, June 30th, 1894, was 16·9 per 1000 of the estimated population. This rate is 5·0 below that for the corresponding week of last year, but 0·3 above that for the previous week of the present year. The lowest mortality was recorded in Edinburgh—viz., 13·1 per 1000—and the highest in Aberdeen—viz., 22·1 per 1000. The deaths from bronchitis, pneumonia, and pleurisy amounted to 74, being 9 above the number for the previous week.

July 4th.

IRELAND.

(FROM OUR OWN CORRESPONDENTS.)

University of Dublin.

ON Thursday, the 28th ult., the Senate of the University of Dublin held a meeting for the purpose of conferring degrees. Honorary degrees were conferred upon Lord Russell of Killowen, the Bishop of Iowa, and the Bishop of North Dakota.

Memorial to Surgeon-Major Parke.

The sculptor has now completed the model in clay. The deceased officer is represented in the dress he wore in Africa; the head is thrown back, while the right arm rests on the barrel of a Winchester repeating rifle, and the left foot on the skull of an antelope. In a short time the statue will be cast in bronze in Belgium, and in a few months will be erected in Dublin. The site has not yet been determined.

Richmond Lunatic Asylum.

At a recent meeting of the governors the architect reported that certain works in connexion with the female division would cost £25,000, and that a like sum would be necessary for the male division. The probable cost of the improvements in the female hospital, he estimated, would be between £4000 and £5000. He thought it would not be prudent to spend so much money for the improvement of the female division, and suggested greater accommodation for females at Portrane, also the disposal of eight acres of ground at Grangegorman; these changes would save an expenditure of £25,000 on the building for females. It was ultimately decided that in the new building at Portrane accommodation should be provided for at least 1200 patients, male and female.

Outbreak of Glanders and Rabies in Cork.

A meeting of the local sanitary authority was held last week, when the outbreak of glanders and rabies in the city was under consideration. A communication was received from Professor McFadyean suggesting that the horses suffering from glanders should be inoculated with mallein, which, he asserted, was an infallible mode of diagnosing the disease. With reference to the outbreak of rabies, the police complain that they were unable to effectually carry out their duty in the matter, owing to the want of a place in which to put any stray or unmuzzled dogs they might seize. The

executive committee of the board of guardians adopted a resolution requesting the corporation to assist them in their efforts to check the spread of rabies by providing a place of detention for those animals.

The Pork Industry.

At the present time the question of the keeping of swine within the city of Belfast is causing considerable public discussion. It seems that for some years the Public Health Committee of the corporation has had the matter before them, and they have drawn up certain by-laws. Originally it was decided that there should be a distance of twelve feet between all dwelling-houses and piggeries, but the Local Government Board recommended that it should be sixty feet; however, now it is recommended that the interval be fifteen feet. When the by-laws were published the pig-keepers were up in arms, as they thought that the industry (which supports a large number of poor people, especially widows with children) would be ruined. At a meeting of the City Council held on July 2nd a lengthened discussion took place, and it was established that the medical officers of Belfast (with one exception) were unanimous that piggeries, as at present existing in Belfast, were a public nuisance. Ultimately, a resolution was carried to refer back the question to the Public Health Committee for further discussion.

Warrenpoint Dispensary.

Dr. Bell has been elected medical officer of the Warrenpoint Dispensary, in succession to Dr. Douglas, deceased.

July 3rd.

PARIS.

(FROM OUR OWN CORRESPONDENT.)

The Assassination of President Carnot: the Lesions discovered post mortem.

PERUSAL of the following report will show that the death of M. Carnot was due to hæmorrhage, the source of which was the portal vein, which the anarchist's dagger had perforated in two places: "La blessure siégnait immédiatement au-dessous des fausses côtes droites, à 3 centimètres de l'appendice xiphoïde. Elle mesurait de 20 à 25 millimètres, et la lame, en pénétrant, avait sectionné complètement le cartilage costal correspondant. La lame du poignard a pénétré l'organe de gauche à droite et de haut en bas, blessant sur son passage la veine porte qu'elle a ouverte en deux endroits. Le trajet de la blessure dans l'intérieur du foie est de 11 à 12 centimètres. Une hémorragie intra-péritonéale, fatalement mortelle, a été le fait de cette double perforation veineuse.—Lyon, 25 juin, 1894.—Docteurs Lacassagne, Henri Contagne, Ollier, Rebatel, Poncet, Michel Gangolphe, Fabre."

Medical Societies: Homage to the Memory of President Carnot.

There do not exist more law-abiding citizens than those who practise our own merciful profession. Proof of this was forthcoming on the information reaching the learned societies of Paris of the dastardly murder of M. Carnot, a personage universally respected not only as a public man but as an individual. At the following societies the meeting was dissolved as a token of sympathy: Académie de Médecine, Société de Chirurgie, and Société de Thérapeutique. At the funeral of M. Carnot on Sunday last the Faculty of Medicine was adequately represented by several professors clad in their picturesque robes. I may mention that a nephew of the late President is at present pursuing his medical studies at this faculty.

Syphilitic Pleurisy coinciding with the Secondary Stage.

In the *Presse Médicale* of the 30th ult. M. Chantemesse publishes a clinical lecture on the above rare complication of constitutional syphilis. The subjects of the lecture were two men who presented the usual stigmata of syphilis in the eruptive stage. In both there were discovered the physical signs of pleurisy with effusion, and in one aspiration with a hypodermic syringe yielded a quantity of straw-coloured serum. Both had râles, due probably to an eruption of roseola on the bronchial mucous membrane. M. Chantemesse has succeeded in collecting twelve similar observations of syphilitic pleurisy. Most of them were cases of dry pleurisy, but in either case the prognosis is favourable, resolution and absorption being the rule under specific treatment. M. Chantemesse treated his patients with intra-venous injections of corrosive sublimate; he nevertheless does not recommend this method, but would prefer intra-muscular injections of the red oxide of mercury dissolved in sterilised olive oil. He says that he has never noticed any stomatitis during a treatment of several months, consisting of daily doses of 4 or 8 milligrammes of the salts dissolved in 1 or 2 cubic centimetres of the oil. The specific character of the pleurisy is plain to M. Chantemesse from the following peculiarities: its bilaterality, the small amount of effusion, its concomitance with the secondary eruption, its complete disappearance without leaving any traces, and its prompt cure by mercury. The lecturer is inclined to believe that the so-called secondary fever of syphilis may in many instances be explained by the existence of this kind of pleurisy, which in the presence of indubitable signs of lues venerea is not suspected or sought for. In one half of the cases bronchitis is present as well, this complication being probably due to the outbreak of a syphilide on the bronchial mucous membrane.

July 3rd.

AUSTRALIA.

(FROM OUR OWN CORRESPONDENT.)

Sanatoria for Phthisical Patients in Australia.

ATTENTION has been recently directed to the need of sanatoria in suitable localities in Australia, where patients in the early stages of phthisis might be treated. One institution of this kind exists at Echuca, on the River Murray, in Victoria, but it contains only fourteen beds and, as will be easily seen, is quite inadequate, the number of cases dying from phthisis in each of the colonies of Victoria and New South Wales being over 1000 a year. Some slight provision is also made for the care of advanced and practically incurable cases at the Austin Hospital for Incurables at Heidelberg, in Victoria, where twelve beds for this purpose were recently reopened, and at the homes for phthisical patients at Parramatta and Thirlmere, in New South Wales. It is highly desirable that more care and judgment should be exercised by the profession in Great Britain in advising this class of patients to go to Australia. Numbers of patients with advanced disease still come out on the vague advice of their medical attendants. They do not know where to go, and generally remain in the seaboard cities, soon spend what little money they have, and drift into the hospitals to die. It must be remembered that it is only in certain inland parts of the island continent of Australia that the climate is suitable for tuberculous affections, such as the plains of the Riverina and those to the west of the great dividing range in New South Wales, and the districts of Maranoa, Warrego, Mitchell, and Gregory in Queensland. But in such places there is not much occupation for those suffering from phthisis, and unless they are well-to-do or have friends in such districts it is useless to send them out to Australia. Were sanatoria established in suitable localities, and only patients in the early stages of the disease admitted, some good might be done, but even then there is quite sufficient tuberculous disease among the native-born population to keep such institutions well filled.

Infectious Diseases Hospitals.

Allusion has been previously made to the necessity that exists of providing hospitals for the isolation of infectious diseases in the large Australian towns. At a recent meeting of the Victorian Branch of the British Medical Association a long resolution was passed to the effect that urgent need exists in Melbourne for a hospital where persons suffering from communicable diseases could be isolated, and where practical disinfection could be carried out. It may be noted that the Victorian Health Act already empowers municipal councils to erect such hospitals, and what is needed is some compulsion to make them carry out the provisions of this Act. It is gratifying to note that some of the municipalities are taking action. At Ballarat a site has been selected and buildings will soon be erected for a sanatorium for infectious diseases.

Hospital Saturday in Sydney.

Although Hospital Saturday has been a recognised institution in several colonial cities, this means of obtaining contributions for the various medical charities has never been adopted in Sydney. On April 28th last the movement was inaugurated in that city, and owing partly to the fineness of

the weather, but chiefly to the enthusiasm with which the ladies entered into the scheme, it proved a great success. No less than £1675 were collected in the streets and will be distributed among all the hospitals.

Prevalence of Diphtheria and Scarlet Fever in Victoria.

Diphtheria continues to be very prevalent in some of the country districts of Victoria, and in a virulent form. At a small township called Tylden eight cases were reported in one week with four deaths, and at another small village called Miepoll six deaths occurred. During the last week thirty-seven cases of scarlet fever were reported, as against thirteen cases for the like period of 1893.

Death under Chloroform.

Another death under chloroform occurred recently at St. Kilda, Victoria. The anæsthetic was administered for the reduction of a dislocation of the shoulder; the patient was seized with an epileptic fit when a small quantity of chloroform had been inhaled and died.

Obituary.

WILLIAM LEES UNDERHILL, F.R.C.S. ENG.

ON June 18th the death of Mr. Underhill of Tipton occurred somewhat suddenly after a long life of eighty years spent in unceasing industry and usefulness. For the greater part of this period Mr. Underhill took an active part in all public work and duties besides the more immediate conduct of his profession. He was for many years chairman of the board of health, surgeon to the Volunteers, and one of the founders of the Guest Hospital, in which institution he ever took a zealous interest. As a magistrate for Staffordshire his judgment and opinion were held in high esteem. Singularly devoid of affectation, he always expressed his views with fairness and courage, while his loyal and disinterested devotion to duty commanded esteem and respect. Genial and kindhearted, he was looked upon by the poor as a friend and as a ready helper in all times of scarcity and want. His high professional worth and the fine qualities of a manly and straightforward character gave him a position which commanded universal regard and afford lasting tribute to his memory. Mr. Underhill belonged to a family of medical men well known for a lengthened period in the South Staffordshire district. Of eight sons six follow in the same profession. These, while they revere his memory, may emulate the constant integrity and high principles of a life whose merits and worth they may strive as their greatest aim to equal and to honour.

FREDERICK CHARLES ROBERTS, M.B., M.S. EDIN.

(OF TIENTSIN).

WITHIN the last few days the death of this able and amiable practitioner has been announced to his friends at home. His university career, his judgment, his weight and charm of character, all guaranteed for him a career at home if he had chosen to pursue his profession here; but an intense philanthropy led him to offer his services to the London Missionary Society in order to accompany Gilmour and work among the Mongols. The death of Dr. Mackenzie of Tientsin occurring just as he arrived in China made some modifications of his plan necessary, there being no one to take charge of the large hospital which the Vice-Roy Li Hung Chang had built in gratitude for the saving of his wife's life by Dr. Mackenzie's skill. For eight or ten years Dr. Roberts, with great skill, assiduity, and tenderness, carried on the work of that institution. In a large city like Tientsin, with a quarter of a million of inhabitants, where overcrowding and other insanitary conditions are found in a degree unimaginable by English people, zymotic disease is always present and from time to time rages fiercely; and Dr. Roberts has succumbed to an attack of typhoid fever. His death is a keen loss to all the European colony in that city and to the cause of missions in China. No record of work like his ever becomes fame, but it is permissible to point out that such men by their heroism of mercy and by their friendly worth give a view of English character to an Imperial people which lays their nation under an obligation to them.

Erratum.—By an obvious clerical error the age of Mr. David Taylor was given in our issue of June 23rd, p. 1597, as thirty-six. It should have been eighty-six.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

ELECTION OF MEMBERS OF COUNCIL.

THE sixth election of Fellows to fill the vacancies on the Council of the College under the new regulations was held in the Library of the Royal College of Surgeons, Lincoln's-inn-fields, on Thursday, the 5th inst., between 2 P.M. and 4 P.M. The result of the voting was as follows:—

	Votes.	Plumpers.
MR. HOWARD MARSH	327	5
MR. REGINALD HARRISON ...	266	4
MR. JAMES HARDIE	250	41
MR. J. N. C. DAVIES-COLLEY ...	215	13
MR. HERBERT W. PAGE	181	13

Mr. Howard Marsh and Mr. Reginald Harrison were declared to be re-elected members and Mr. James Hardie was elected a member of the Council.

There were 453 voting papers sent out, but only 383 proxies were received in time; of the others 8 were returned too late. Six voting papers were declared invalid.

The meeting of Fellows was held subsequently to the announcement of the result of the election, and is proceeding at the time of our going to press. We shall publish a report of the proceedings in our next issue.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS AND SURGEONS.—The following gentlemen passed the second examination of the Board in the subjects indicated at a meeting of the examiners on Monday, July 2nd:—

Anatomy and Physiology.—John Edward Hodgson and Sydney Herbert Watton, students of Owens College, Manchester; Edward Payton Burns, Frank Smallpage Hunter, and Thomas James Clift, of Mason's College, Birmingham; Frederic Percival Mackie, Frank Herbert Rose, William Stuart Vernon Stock, Albert Stephen Hayman, and Henry Lawrence Weekes Norrington, of University College, Bristol; John Harry Watson, of University College, Liverpool; William Carnes, of Yorkshire College, Leeds; and Samuel James, of Royal College of Surgeons, Edinburgh.

Anatomy only.—Harry Harte Gourley, of Edinburgh and Durham Universities; Alexander Evans, of St. Mungo's College, Glasgow; Percy Haughton Stratton, Sidney Kendrick Vines, and Edward Howard Collins, of Mason's College, Birmingham; George Henry Heron, of University College, Liverpool; Arthur Cubley, of Firth College, Sheffield; Herbert Markby and Alexander Campbell Nicol, of Yorkshire College, Leeds; Henry George Lidley Anderson, of Owens College, Manchester; and George Edward Bowring, of Cambridge University and Owens College, Manchester.

Physiology only.—George Henry Whitaker Whiteside, M.D. Harv., of Harvard University and Ecole de Médecine, Paris; William Ernest Fairweather, Charles Henry Bradbury, James Wallwork, Reginald Tarbuck, and Julio Daniel Eastman, of Owens College, Manchester; Vernon Kent Blackburn, of Firth College, Sheffield; Charles Durban Ingle, Francis Philip Gill, and Arthur Bernard Cridland, of University College, Bristol; Thomas Aloysius Caley, of Yorkshire College, Leeds; and Frank Herbert Wilkinson, of University College, Leeds.

11 candidates were referred in both subjects, 7 in Anatomy only, and 6 in Physiology only.

Tuesday, July 3rd:—

Anatomy and Physiology only.—Ernest Hugh Kitchin, student of Yorkshire College, Leeds; Matthew Edmund Smallwood, of University College, Liverpool; Avery Wynn Dickson, Francis Lionel Provis, Joseph Henry Churchill, and Robert Pollock Brown, of St. Bartholomew's Hospital; Sydney Duke Turner, Herbert Thomas Marmaduke Alford, and Allan Chilcott Parsons, of St. Thomas's Hospital; Horace Clare Regnart, William John Saundry Harvey, and Guys Nasmith Mottram, of Guy's Hospital; Harold Henry Jamieson and Harry Percival Foulerton, of St. George's Hospital; John Geddes Scott, of Westminster Hospital; James William Turner, of Mason's College, Birmingham; and Godkin Downes, of Carmichael College, Dublin.

Anatomy only.—Reginald Thomas Richmond, of Cambridge University and Mr. Cooke's School of Anatomy and Physiology; George Woodyatt Procter, of Durham University and Middlesex Hospital; Charles Patrick Higgins, of Guy's Hospital; Arthur Rochefort Todd, of University College, London; Arthur Reginald Jones, of St. Thomas's Hospital; and Thomas Ashcroft Ellwood, of Charing-cross Hospital.

Physiology only.—Stanley Bean Atkinson, Elliot Wilson Woodbridge, John Francis Swift, and Robert Neville Geach, of St. Bartholomew's Hospital; Alfred James Andrew Lennane, of University College, London; Clarence Reginald Dearden, of Firth College, Sheffield; Daniel Lloyd Smith, of Guy's Hospital; Eugene Grant, of King's College Hospital, London; and Frederick Gerald Verity, of Charing-cross Hospital.

Eight candidates were referred in both subjects, four in Anatomy only, and two in Physiology only.

Wednesday, July 4th :—

Anatomy and Physiology.—Harold Alfred Scholberg, William Townsend Storrs, Spencer Hunt, and Gilbert Edwin French, students of St. Bartholomew's Hospital; Marmaduke Stephen Mayon, Frederick Hudson Evans, and Francis Joseph Hasslacker, of King's College, London; Malcolm Arthur Smith, Thomas Latimer Glanville, Rance Dreweath Johnson, and Rowland William Collum, of Charing-cross Hospital; John Beresford Christian, of St. George's Hospital; Charles Henry Massop, Percy William Moore, Arthur Thomas Falwasser, Edward Hugh Pomeroy, and Charles Rowley Nicholson, of Guy's Hospital; Oscar Levy, of Berlin, Munich, and Freiburg Universities; Archibald James Bennetts, of St. Mary's Hospital; and John Miles Chambers, of Oxford University and St. Thomas's Hospital.

Anatomy only.—Edgar John Gruchy, of London Hospital.

Physiology only.—William Harold Crossley, of St. Bartholomew's Hospital; Willam Henry Gray, of University College, London; and Charles Frederick Backhouse, of King's College, London.

Twelve candidates were referred in both subjects, one in Anatomy only, and three in Physiology only.

UNIVERSITY OF DUBLIN.—The following degrees were conferred last week :—

Licentiate in Medicine, Surgery, and Obstetrics.—Michael Joseph Smith.

Bachelor in Medicine.—William John Thompson.

Bachelor in Medicine, Surgery, and Obstetrics.—Cecil Brew, Maynard Campbell Carmichael, Richard Alfred Friel, Edmund Ernest Goodbody, Francis Woodcock Goodbody, Robert Ross Hastings, Henry Kirkpatrick, Rev. John Logan, Henry Carter Martier, Robert Warren Merrick, Alexander Charles O'Sullivan (stip. cond.), Arthur Joseph Henry Thornton, Joseph William Watkins, and Frederick Edward Wynne.

Doctor in Medicine.—Henry Edmund Blandford, Joseph Wallace Boyce, Henry Cooke Drury (stip. cond.), William Fenton, Richard Percy Jones, Mark Thomas Kelly, Ludovic George Frederick Macrory, William Arthur Valentine, and Claude Ernest Wellington Wilmot.

Master of Arts.—Dr. Henry Edmund Blandford.

ROYAL COLLEGE OF SURGEONS IN IRELAND.—The following gentlemen have been elected Examiners :—Vital Statistics : D. Edgar Flinn. Dentistry : T. Studley. Mathematics and Physics : R. Morton. The following gentlemen have been elected Examiners under the conjoint scheme with the Apothecaries' Hall :—Anatomy : J. J. Burgess. Surgery : J. Harrison Scott. Pathology : C. Coppinger and R. G. Patteson. Physiology, Histology, and Biology : T. F. Knott and G. B. White.

THE WORTHING EPIDEMIC.—The balance-sheet of the committee who dispensed the mayor's Sick and Poor Fund during the epidemic of enteric fever at Worthing last year has just been issued and deals with the expenses up to April 21st last. In July a sum of over £1000 was raised locally, but, this proving inadequate to meet the increasing distress, further appeals raised the sum to £8803 4*s.* 11*d.* The persons most particularly affected in consequence of the epidemic were those in whose homes sickness prevailed; in lodging-house keepers, boatmen, Bath-chair men, small fly proprietors, small traders, and labourers.

THE Medical Defence Union is rapidly gaining ground. There have been 623 new members elected this year already, and fresh applications for membership are being received weekly. The Guarantee Fund, which has not been touched, amounts to £5063, the new members of this year alone guaranteeing £990. There have been twenty-three council meetings during the half-year ending June 24th, and nearly 400 "cases" have been dealt with. The resignations this year only number twenty-four, a very small percentage of the total membership. Many important prosecutions and "defences" have been undertaken on behalf of members. The offices of the Union are at 20, King William-street, W.C.

THE new public abattoir at Brighton was opened last Saturday by the mayor of that town (Alderman Dr. Joseph Ewart, J.P.), who was accompanied by the mayoress, Miss Ewart. The proceedings were witnessed by a considerable number of the officials and members of the corporation, while it can be well believed that the representatives of the local butchering trade took a keen interest in the proceedings. The site of the new abattoir has been well chosen, and the accommodation is admirable. There are private and public slaughter-houses, of which the former comprise a separate lock-up, killing room, fasting lair, and hanging room. After a brief statement by the mayor had been made of the circumstances under which the abattoir had been found necessary, and therefore erected, Mr. Charles Longley presented the speaker with a silver key ornamented with the borough arms surmounted by a bullock's head, and inscribed with suitable compliment to the mayor, who then proceeded to unlock the various doors and declare the building open.

THE Rev. S. A. Barnett and Mr. Hamer have called attention in the *Times* to the Children's Country Holidays Fund, the object of which is to enable poor children to spend a fortnight in a cottage home. Last year 28,589 children were sent to the country by the aid of this fund; but there are over 700,000 children in our London schools, so that the proportion who participated in the benefits of the fund last year was not very high. Ten shillings secures a holiday for one child, and the administration expenses amount to only 7*d.* a head. This season of the year when universal thought is directed to the annual holiday is an appropriate one for calling attention to the appeal. Donations should be sent to the Hon. Alfred Lyttelton, 10, Buckingham-street, Strand, W.C.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Contagious Diseases (Animals) Act.

A BILL has been introduced in the House of Commons with the object of making the procedure with respect to infective areas in the case of infectious cattle disease more elastic. The Bill, being of a non-contentious character, is likely to pass quickly through its various stages.

The Petroleum Committee.

The reference for this Committee, proposed by the Government, is in the following terms—viz.: "To inquire into and report upon the law relating to the keeping, selling, and conveyance of petroleum and other inflammable liquids, including the precautions to be adopted to prevent the sale of dangerous lamps for use with inflammable liquids."

HOUSE OF COMMONS.

FRIDAY, JUNE 29TH.

The Plague.

Mr. Buxton informed Mr. Webster that a telegram had been received on June 28th from the Governor of Hong-Kong stating that the epidemic was abating. The mortality up to the present time was 2215. From despatches received it appeared that the plague had been introduced into the colony from Canton. Special hospitals had been provided, additional medical men had been employed, and a house-to-house visitation had been instituted, as well as regular flushing and disinfection of all drains and infected houses. The question of increasing the water-supply of the colony was under consideration.

TUESDAY, JULY 3RD.

Army Medical Establishments.

In Committee of Supply some discussion took place with respect to the administration of the medical department of the army. Mr. Jeffreys directed attention to the wide discretion given to medical men, which enabled them to declare "unsound" a candidate who had passed two examinations.—Mr. Campbell-Bannerman expressed the opinion that if there was a fault in the present system of examination it arose from the fact that medical officers were not sufficiently strict. If any change was introduced it would be in the direction of greater stringency.—Mr. Hanbury made some remarks with reference to the frequent changing of the senior medical officers at the principal military stations. This, he believed, arose partly from the fact that the appointments were reached by order of seniority only. It was essential that the medical staff of the army should be composed of the cleverest men that could be found in the medical profession. He urged that the Director-General should inspect his own department more frequently.—General Goldsworthy emphasised the concluding remarks of Mr. Hanbury.—In the course of his reply the Secretary for War stated that complaints had been made against the management of the Medical Department, but he had found nothing definite in them. There was too often what looked like personal animus in the complaints. As far as could be possible with fairness he was in favour of promotion by merit, and the Director-General was also in favour of this mode of promotion. With regard to the complaint that clerical work is given to medical officers, and medical work to civilian clerks, the right honourable gentleman was not satisfied that that was the case, but would make further inquiries into the subject.—Colonel Lockwood called attention to the sanitary arrangements at Woolwich Arsenal, and Mr. Pierpoint referred to the case of Surgeon-Colonel Briggs.—In reply to Mr. Hanbury, Mr. Campbell-Bannerman said the Army Medical Corps had recently had some training, and he had gone as far as the funds at his disposal would permit him.

THURSDAY, JULY 5TH.

The Coal Dust Question.

Mr. Pritchard Morgan addressed to the Home Secretary a long series of questions with reference to explosions in mines due to the presence of coal dust.—Mr. Asquith in the course of his reply stated that whether the recent disastrous explosion at the Albion Colliery in South Wales was due to coal dust was a matter now being investigated. He thought it would be premature on the part of the Home Office to recommend any particular mode of dealing with the danger pending the report of the Coal Dust Commission, which was expected during the present week. The matter was one in regard to which experts held different opinions.

IN COMMITTEE.

The Adulteration of Food Products.

The Select Committee of the House of Commons on the Adulteration of Food Products met on Tuesday, the 3rd inst., under the presidency of Sir Walter Foster, and began the examination of witnesses.

Mr. Herbert Preston Thomas, one of the general inspectors of the Local Government Board, examined by the chairman, said that until recently he was in charge of the Public Health Department of the Board, which, among other things, had to deal with the administration of the Sale of Food and Drugs Act. In 1875 the principal Act was passed, in 1879 an amending Act, and in 1887 the Margarine Act. There were 237 districts for which analysts had been appointed, these practically covering the whole country. Before the Local Government Board approved the appointment of an analyst they required a statement of his qualifications. They required also that he should produce evidence as to microscopical, chemical, and, to a certain extent, medical knowledge—that was to say, the effect of adulteration upon health. In many instances one analyst acted for several districts, but no practical difficulty or inconvenience arose in this connexion. Medical officers of health and one or two other officers were empowered to obtain samples, but as a rule the samples were taken by the inspectors of nuisances, the inspectors of weights and measures, and in some cases by the police. In experience it was found that private persons did not care to go through the trouble and formalities of getting samples, and that unless they were sure they were being cheated they did not like taking cases into court. Practically, all the samples analysed were taken by inspectors on behalf of local authorities. The first part of the Act dealt with adulterations injurious to health, and that part had been very little used. In the first place, adulterations injurious to health had diminished very much since the old days of THE LANCET inquiries, and in the second place the expenses were high and guilty knowledge must be proved, which of course was a matter of great difficulty. Among other things, the Act of 1879 authorised samples of milk to be taken in transit at railway stations, and fixed the standard of strength for spirits. The Act of 1887 provided for the marking of margarine, increased the maximum penalty and did a number of other things. He had every respect for the fitness and qualification of the analysts who had been appointed. He considered that the great progress made in the science of analysis during the past eighteen or nineteen years was largely due to their efforts, and that very few absolute blunders had been made by them. Each analyst had to make to the authority appointing him a quarterly report stating the results of his work, and these reports were sent in yearly to the Local Government Board. From 1877 to 1883 the number of samples taken rose from 14,706 to 19,648. In 1884 the board issued a circular to sanitary authorities urging them to exercise their power of submitting samples for analysis, and at once there was a rise in the number of samples to 22,961. The subsequent increase had been very constant, the number for 1893 being 37,233. The board had urged in various communications that at least one sample should be taken for each 1000 of population, and it was not until 1891 that this proportion was reached. By last year the proportion had risen to one sample for every 779 of the population. These figures were based upon the general average all over the country. In London the proportion was one sample to every 530 persons and in the provinces one to every 847 persons. He was sorry to say that there were 45 districts, with an aggregate population of nearly three millions, in which the Sale of Food and Drugs Act was either altogether in abeyance or so inadequately administered that the number of samples taken was quite insignificant, amounting altogether to 496, or one sample during the year for every 5720 persons. In all districts everything depended on the will of the local authorities. When no samples were taken, or very few of them, the Local Government Board addressed a communication calling the attention of the County Council or Borough Council or local authority, as the case might be, to the fact that the Acts were not properly enforced in their district. Sometimes this action was followed by an improvement but sometimes not. In computing the results of the analyses he had begun with the year 1877, and he found that during the five years, 1877–81, the percentage of samples reported as adulterated was 16·2; in the following five years ending with 1886 it was 13·9; and in the following five years ending 1891 it was 11·7. The minimum was reached in 1888, when the percentage fell to 10·8. Since that year there had been some increase, and last year the percentage was 12·9, mainly owing, he thought, to the two items of milk and spirits. It must be remembered, however, that of the samples thus broadly classed as adulterated, there were many in which the adulteration was so small in amount that it would not be, and was not thought to be expedient to take the cases into court. Taking the year 1893 he found that 4793 samples were reported against. Proceedings were taken in 3174 instances, and in 2687 of these fines were imposed, the aggregate amount of the fines being £25091. The average penalty thus amounted to £1 17*s.* 11*d.*, as against £1 16*s.* 2*d.* in 1892 and £1 11*s.* 3*d.* in 1891. It was very often said, and frequent representations had been made to the Local Government Board, that the fines imposed were insufficient, and that it paid traders to discharge them and go on adulterating their wares. Frequent suggestions had been made that the Legislature should provide a minimum fine, but that, of course, would be opposed to the whole tendency of modern legislation in such matters, and, he ventured to say, would not secure the object in view, for in many cases where a small fine was now imposed there would be none at all. The article of which they received most samples was milk, and after it butter, spirits, lard, coffee, pepper, vinegar, bread, mustard, tea, beer, flour, confectionery (including jam), cheese, sugar, arrowroot, cocoa, and drugs. About one-third of the entire number of samples analysed were milk. In 1893, out of 37,233 samples of all kinds, 15,543 were of milk, and of these 2310, or 14·9 per cent., were reported against. In 1542 cases legal proceedings were taken, with the result that 152 cases were dismissed, 55 were withdrawn, in 43 cases costs only were ordered to be paid, and in the remaining 1292 cases penalties were imposed, amounting in all to £2915. Practically the only adulteration was water. If the adulteration by means of chalk that used to be talked about so much ever existed, it certainly did not exist now, except to a very limited extent, there having been only two or three cases during the last fifteen years. They found that the percentage of adulteration rose in years when grass was scarce, such, for instance, as the Jubilee year and last year, and that in such a year as 1888, when there was a heavy crop of grass and other food for cattle, there was very little adulteration of milk. The question of the adulteration of milk was the most difficult one that had arisen under the Food and Drugs Act. Science in its present condition could not distinguish rich milk which had been watered from milk which had not been watered, but was the product of a very old or badly fed cow. It was quite possible that a man might be brought up for adulterating his milk when, as a matter of fact, its condition was due to the age of the cow or the quality of the food it ate. Great difficulty was experienced in arriving at any standard of solids that milk should contain. In the examination of the genuine milk of each of 273 cows by the chemical officers of the Inland Revenue, it was found that the total solids varied from 10·3 to 15·8 per cent. If between these limits a high standard were fixed the result would be to condemn much genuine milk; and if, on the other hand, a low standard were fixed there would be a general tendency to water down milk. Again, if they fixed the standard low enough to include all cases of genuine milk they might as well give up the thing altogether. It was a rare thing to find milk watered down to the quality that the worst sort of cows would produce. They had come across instances where the cow had been milked in the presence of the analyst, and the total solids had been found to fall below even 10·3, and as low in one instance as 9 per cent. Condensed milk was often made from skimmed milk, and contained very little nourishment. Infants, it was said, would be half starved if they fed upon certain condensed milks alone. As skimmed milk could not be sold without a declaration that it was skimmed, it was a question whether the same thing should not apply to condensed. The board had received a very powerfully signed representation from eminent members of the medical profession in London, from a large number of analysts, and from other persons whose opinion would carry weight in such matters, as to the harm being done by the use of inferior brands of condensed milk. It was becoming a serious evil because people did not understand the difference between one brand and another, and they probably could not tell without analysis whether or not it was pure. The attention of the Local Government Board had also been called to what was known as separated milk, the nutritive power of which must be small indeed. About one-sixth of the samples reported upon were butter, and it would seem that under this head there had been no decline in the amount of adulteration. In 1893 there were 794 samples of butter and so-called butter reported against. There were 604 prosecutions, 29 cases being dismissed, 6 withdrawn, in 18 the offenders were required to pay costs, and in 551 cases penalties of the aggregate amount of £1150 1*s.* 6*d.* were imposed. The two great adulterants of butter were margarine and water. As in the case of milk, they had no standard as to the amount of water that could be allowed. In 1893 there were analysed 3971 samples of spirits, of which 782, or nearly 20 per cent., were reported against for excess of water. The practice of introducing deleterious ingredients seemed, so far as these returns went, to have almost entirely disappeared, if it had ever existed. In the case of spirits, they had a standard fixed by the Act of 1879, which simplified the work of the analyst very much indeed. Before that Act there was no determining what was spirits and what spirits-and-water. In regard to coffee, there had been some diminution in the percentage of the samples reported against, which was about 18 per cent. from 1877 to 1886, and had since been about 15 per cent. In many cases the proportion of chicory had risen greatly, in one case to 90 per cent. of the whole mixture. Some of the preparations were sold with labels on which the word "coffee" was printed prominently, while "chicory" was scarcely legible. In one case the coffee was ground before the eyes of the inspector, and the vendor, perhaps, thought it would not be sent to the analyst after all. It was, however, sent, and was found to be largely adulterated with chicory. There used to be a practice of compressing chicory into the shape of coffee berries, and that, no doubt, must have been done in this case. He merely cited this as a curiosity. About 8 per cent. of the samples of lard were condemned. As to pepper, it seemed that it was no longer adulterated to any considerable extent, but during the last three years the proportion of samples reported against had only been about 2 per cent. A few years ago very active steps were taken to put down the adulteration of pepper. Until recently few samples of vinegar were taken for analysis, last year 1015 were taken as compared with 186 in the previous year. Of the 1015 nearly 16 per cent. were reported against, mostly on account of being produced from substances other than malt. It certainly seemed as though there had been a raid upon the vinegar people. In regard to bread and flour it appeared that there was practically no adulteration, and very little in connexion with mustard. As to beer, the remarkable thing was that, although they were constantly hearing about drugged beer and stupefying chemicals which had such a great effect in producing drunkenness, yet so far as the official returns showed, the only adulterant of beer was salt. He should explain, however, that under the existing law beer might contain substitutes for malt and hops, and it was difficult for an analyst to condemn beer unless upon the presence of salt, which could not be regarded either as a malt or hop substitute. Much harm used to be done by confectionery, through the introduction of injurious pigments but these were no longer used. Out of nearly 1600 samples of tea examined during the last four years, not one had been reported against. This was probably due to the fact that tea was subject to examination by the Customs authorities when in bond. As to drugs their adulteration was not nearly so common as it used to be. From time to time suggestions were offered to the Local Government, and he proposed to submit a few of them to the Committee without expressing any opinion of his own. One was that the wholesale vendor should be brought within the reach of the Acts. Another was that with section 25 of the Act of 1875 should be incorporated a provision similar to that in section 47, subsection 3, of the Public Health (London) Act, 1891, relating to the seizure of unsound meat. Various suggestions had been made as to invoices being regarded as warranties. Local authorities had complained that while they were compelled to meet the costs of prosecutions under the Acts, the fines imposed went not to them, but to the county fund. Another suggestion was that there should be some sort of standard as to the quantity of water to be permitted in butter.

By Sir Mark Stewart: He was clearly of opinion that there was a desire in many quarters to have this question inquired into. Many difficulties had cropped up in connexion with the administration of the Acts, and these naturally demanded attention.

By the Chairman: He would strongly advise the Committee to ascertain what steps had been taken in Paris and Berlin to deal with the difficulties in regard to milk and butter, for he understood they had been successfully overcome in these cities.

The Committee then adjourned.

Appointments.

Successful applicants for Vacancies, Secretaries of Public Institutions, and others possessing information suitable for this column, are invited to forward it to THE LANCET *Office, directed to the Sub-Editor, not later than 9 o'clock on the Thursday morning of each week for publication in the next number.*

BANCROFT, JOS., M.D. St. And., M.R.C.S., has been appointed Honorary Consulting Medical Officer to the Brisbane Hospital, Queensland.

BROWNE, B. S., L.R.C.P., L.R.C.S. Edin., has been appointed Medical Officer for the Seventh Sanitary District of the Depwade Union.

BULLMORE, W. K., M.D. St. And., M.R.C.S., has been reappointed Medical Officer to the Falmouth and Truro Port Sanitary Authority.

CATTLEY, ROBT., M.B., C.M. Edin., has been appointed Medical Officer, *pro tem.*, for the York Urban District, vice North, deceased.

CHILCOTT, A. E., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Superintendent at the Highgate Infirmary.

DICKENS, F. W., M.B. Melb., has been appointed Public Vaccinator for Beulah, Victoria, Australia.

EDWARDS, G. M., B.A., M.B., B.C. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., has been appointed House Surgeon at the Middlesex Hospital.

FISHER, J. B., M.B., M.S. Edin., has been reappointed Medical Officer of Health for the Rural Sanitary District of Whitehaven.

GAYLOR, EDWD., L.R.C.P., L.M. Edin., L.F.P.S. Glasg., has been reappointed Medical Officer of Health for the Ripley Urban Sanitary District.

GILES, OSWALD, L.R.C.P. Lond., M.R.C.S., has been reappointed Medical Officer of Health for the Sleaford Rural and Urban Sanitary Districts.

GRANGER, E. B., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Great and Little Milton Sanitary Districts of the Thame Union.

KERRELL, WM., L.R.C.P. Lond., M.R.C.S., has been appointed Honorary Physician to the Brisbane Hospital, Queensland.

LEE, B. JOHN, L.S.A., has been reappointed Medical Officer for the North Wingfield Sanitary District of the Chesterfield Union.

LEY, G. J., M.B. Melb., has been appointed Health Officer for Dunmunkle Shire, N.R., Victoria, Australia.

LODWIDGE, W. C., L.R.C.P. Lond., M.R.C.S., has been appointed Medical Officer for the Butterwick Sanitary District of the Gainsborough Union.

MACLAREN, J., M.B., C.M. Edin., has been appointed Fifth Assistant Medical Officer to the West Riding Asylum, Wadsley, Sheffield.

MARKS, C. F., M.D., M.S., L.R.C.S. Irel., has been appointed Honorary Surgeon to the Brisbane Hospital, Queensland.

MOULE, E. E., M.B., B.S. Adel., has been appointed Public Vaccinator in South Australia.

MUDGE, JAS., L.R.C.P., L.M. Edin., M.R.C.S., has been reappointed Medical Officer of Health to the Penzance Rural Sanitary Authority.

MULLEN, J. J., L.K.Q.C.P., L.R.C.S. Irel., has been appointed Honorary Consulting Medical Officer to the Brisbane Hospital, Queensland.

O'DOHERTY, K. J., L.K.Q.C.P., L.R.C.S., L.M. Irel., has been appointed Honorary Consulting Medical Officer to the Brisbane Hospital, Queensland.

OWENS, E. M., L.R.C.P. Lond., M.R.C.S., has been appointed Honorary Medical Officer at the South Brisbane Branch Dispensary, Queensland.

PALMER, AMBROSE M., L.R.C.P., L.M. Edin., M.R.C.S., has been reappointed Medical Officer of Health for Whittington.

PALMER, HAROLD L., M.R.C.S., has been reappointed Medical Officer of Health for the Newton Urban Sanitary District.

READ, S. J. D., M.B. Melb., has been appointed Public Vaccinator for the Melbourne Women's Hospital, Australia.

ROBINSON, EDWD. S., L.R.C.P. Lond., M.R.C.S., has been reappointed Medical Officer of Health for Stourport.

ROBINSON, H., L.R.C.P., L.R.C.S., L.M. Edin., has been reappointed Medical Officer for the Hasland Sanitary District of the Chesterfield Union.

SCOTT, E. H., M.B., Ch.M. Syd., has been appointed Public Vaccinator for the District of Takaka, New Zealand.

SHORTRIDGE, THOS. M., M.D. Brux., L.R.C.P., L.R.C.S., L.M. Edin., has been reappointed Medical Officer of Health for Honiton.

SYMES, WILLIAM S., L.R.C.P., L.M., L.R.C.S. Irel., has been reappointed Medical Officer of Health for the Newbold Urban Sanitary District.

TAYLOR, W. F., M.R.C.S., has been appointed Honorary Ophthalmic Surgeon to the Brisbane Hospital, Queensland.

THOMAS, ROBT. STANLEY, M.A., M.B., B.C. Cantab., M.R.C.S. Eng., L.R.C.P. Lond., has been reappointed Casualty Surgical Officer to the Middlesex Hospital.

THOMSON, JOHN, M.B., M.S. Edin., has been appointed Honorary Surgeon to the Brisbane Hospital, Queensland.

THOMPSON, WELLESLEY H., M.D. Durh., L.R.C.P., L.M., L.R.C.S. Edin., has been reappointed Medical Officer of Health for the Quarry Bank Urban Sanitary District.

WARD, W. ALFRED, M.R.C.S. Eng., L.R.C.P. Lond., L.S.A., has been reappointed Casualty Medical Officer to the Middlesex Hospital.

WHITESTONE, A. M., M.B., B.Ch. Dubl., has been appointed Medical Officer for the Workhouse and the Second Sanitary District of the Hollingbourne Union.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

BRIDGWATER INFIRMARY.—House Surgeon. Salary £70 per annum, with board and residence.

CHARING-CROSS HOSPITAL, Strand, London, W.C.—Assistant Surgeon.

EAST LONDON HOSPITAL FOR CHILDREN AND DISPENSARY FOR WOMEN, Glamis-road, Shadwell, E.—Resident Medical Officer. Salary, £30 per annum, with board and residence.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Resident House Physicians.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton.—Two Assistant Physicians.

LIVERPOOL NORTHERN HOSPITAL.—Assistant House Surgeon. Salary £70 per annum, with residence and maintenance in the house.

MANCHESTER HOSPITAL FOR CONSUMPTION AND DISEASES OF THE THROAT AND CHEST.—Assistant Medical Officer. Honorarium £25 per annum.

NATIONAL DENTAL HOSPITAL, Great Portland-street, London, W.—Anæsthetist.

NORTH-EASTERN HOSPITAL FOR CHILDREN, Hackney-road, N.E.—Junior House Physician for six months. Board and lodging (including washing) provided.

NORTH STAFFORDSHIRE INFIRMARY AND EYE HOSPITAL, Hartshill, Stoke-upon-Trent.—House Physician. Salary, £100 per annum, increasing £10 per annum at the discretion of the Committee, with furnished apartments, board, and washing.

ROCHDALE INFIRMARY AND DISPENSARY.—House Surgeon, unmarried. Salary £80 per annum, with board and residence.

ROYAL LONDON OPHTHALMIC HOSPITAL, Moorfields.—Senior House Surgeon. Salary £75 per annum, with board and residence.

SOUTHPORT INFIRMARY.—House Surgeon. Salary £100 per annum, with board, furnished rooms, and attendance.

ST. LUKE'S HOSPITAL, London, E.C.—Clinical Assistant for six months. Board and residence provided.

SUSSEX COUNTY HOSPITAL, Brighton.—House Surgeon, unmarried. Salary £120, rising to £140 per annum, at the discretion of the Committee of Management, with board and residence in the hospital, and his washing.

THE CAMBRIDGESHIRE, &c., LUNATIC ASYLUM, at Fulbourn, near Cambridge.—Assistant Medical Officer. Salary £140 per annum, with board, lodgings, and attendance in the Asylum.

UNIVERSITY COLLEGE, London.—Resident Medical Officer in the Hospital.

VICTORIA UNIVERSITY, The Yorkshire College, Leeds.—Demonstrator of Physiology. Salary £150.

WEST LONDON HOSPITAL, Hammersmith-road, W.—Dermatologist, and also to undertake the duties of Honorary Curator of the Museum, the two offices being held conjointly.

Births, Marriages, and Deaths.

BIRTHS.

ARKWRIGHT.—On July 1st, at Townsend House, Halesowen, Worcestershire, the wife of Joseph A. Arkwright, M.B., of a daughter.

ARNOLD.—On July 1st, at Park-road, Forest-hill, S.E., the wife of Ernest Charles Arnold, M.B., F.R.C.S. Eng., of a son.

BEAMAN.—On June 28th, at Hulme Lodge, Eastbourne, the wife of Deputy-Surgeon-General Ardern Hulme Beaman, of a son.

DICKSON.—On June 29th, at Marlow, Bucks, the wife of John Dunbar Dickson, M.D., of a son.

MORTIMER.—On July 2nd, at Horley, the wife of J. D. Mortimer, M.B., of a daughter.

ROBERTS.—On June 27th, at Holbein-place, Chelsea, S.W., the wife of Edward A. Roberts, M.D., of a son.

SANDERS.—On July 1st, at 15, Alva-street, Edinburgh, the wife of Gordon Sanders, M.B., F.R.C.P., of a son.

SHAW.—On July 1st, at St. Thomas's-street, S.E., the wife of Lauriston E. Shaw, M.D., F.R.C.P., of a son.

SPRAGUE.—On July 2nd, at Easdale, Streatham, the wife of Surgeon-Lieutenant William Carr Sprague, 23rd Bombay Infantry, Rajkot, India, of a son.

THORNTON.—On June 29th, at 14, Cecil-square, Margate, the wife of Bertram Thornton, of a daughter.

MARRIAGES.

CHURCH—KIRKHOUSE.—On July 3rd, at St. Dunstan's, Cheam, Basil Edmund Church, surgeon, The Gables, Minchinhampton, Gloucestershire, to Mary, elder daughter of the late Geo. Kirkhouse, M.R.C.S., Ponterdawe, S. Wales.

HUGHES—GARSIDE.—On July 4th, at St. Paul's Church, Leamington, by the Rev. G. Bassett Kerry, M.A., Edward Lucas Hughes, M.R.C.S. Eng., L.R.C.P. Lond., Whitchurch, Hants, to Sarah Louisa, younger daughter of the late Rev. Joseph Garside, Newbold-terrace East, Leamington.

POPE—GIBB.—On July 4th, at St. Giles's Cathedral, Edinburgh, Percy Pope, M.R.C.S., L.R.C.P., of Hartree House, Fulham, S.W., to Laura Margaret Gibb, youngest daughter of the late J. Gilchrist Gibb, of Bervie, N.B.

WYNNE-JONES—CHARTER.—On June 27th, at St. Martin's-in-the-Fields Church, Trafalgar-square, Thomas Joseph Wynne-Jones, L.R.C.P., &c., of Southborough, Tunbridge Wells, to Gertrude Geraldine Mary, eldest daughter of the late Rev. J. H. E. Charter, Severn Villa, Shrewsbury.

DEATHS.

JACKSON.—On July 1st, in his 44th year, George Elwes Corrie Jackson, F.R.C.S. Edin., of Great Marlborough-street.

WATKINS.—On June 28th, at Wherstead-road, St. Mary's, Stoke, Emma Cecilia, the dearly beloved wife of Charles Stuart Watkins, M.R.C.S. Edin., &c.

WORTH.—On June 21st, at Anderton, Plymouth, Edwin James Worth, M.R.C.S., L.S.A., L.M., aged 59.

N.B.—A fee of 5s. is charged for the Insertion of Notices of Births, Marriages, and Deaths.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, July 5th, 1894.

Date.	Barometer reduced to Sea Level and 32° F.	Direction of Wind.	Dry Bulb.	Wet Bulb.	Solar Radia in Vacuo.	Maximum Temp Shade.	Min Temp	Rainfall.	Remarks at 8.30 A.M.
June 29	30·33	S.E.	60	55	121	81	52	...	Fine
,, 30	30·36	S.E.	68	61	125	83	55	...	Fine
July 1	30·30	E.	74	66	123	82	59	...	Fine
,, 2	30·12	W.	74	65	123	82	63	...	Fine
,, 3	30·10	W.	65	61	119	74	61	0·02	Fine
,, 4	30·17	W.	63	56	119	75	54	...	Fine
,, 5	30·15	S.E.	66	59	120	78	58	...	Fine

Medical Diary for the ensuing Week.

OPERATIONS.

METROPOLITAN HOSPITALS.

MONDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), St. George's (1 P.M.), St. Mark's (2 P.M.), Chelsea (2 P.M.), Samaritan (Gynecological, by Physicians, 2 P.M.), Soho-square (2 P.M.), Royal Orthopædic (2 P.M.).

TUESDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), Guy's (1.30 P.M.), St. Thomas's (3.30 P.M.), Westminster (2 P.M.), West London (2.30 P.M.), University College (2 P.M.), St. George's (1 P.M.), St. Mary's (1.30 P.M.), St. Mark's (2.30 P.M.), Cancer (2 P.M.).

WEDNESDAY.—St. Bartholomew's (1.30 P.M.), University College (2 P.M.), Royal Free (2 P.M.), Middlesex (1.30 P.M.), Charing-cross (3 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), Gt. Northern Central (2.30 P.M.), King's College (2 P.M.), National Orthopædic (10 A.M.), St. Peter's (2 P.M.), Samaritan (2.30 P.M.), Gt. Ormond-street (9.30 A.M.).

THURSDAY.—St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), University College (2 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), London (2 P.M.), King's College (2 P.M.), Middlesex (2 P.M.), Chelsea (2 P.M.), Soho-square (2 P.M.), North West London (2 P.M.).

FRIDAY.—London (2 P.M.), St. Bartholomew's (1.30 P.M.), St. Thomas's (3.30 P.M.), Guy's (1.30 P.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), King's College (2 P.M.).

SATURDAY.—Royal Free (9 A.M. and 2 P.M.), Middlesex (1.30 P.M.), St. Thomas's (2 P.M.), London (2 P.M.), University College (9.15 A.M.), Charing-cross (3 P.M.), St. George's (1 P.M.), Cancer (2 P.M.).

At the Royal Eye Hospital (2 P.M.), the Royal London Ophthalmic (10 A.M.), the Royal Westminster Ophthalmic (1.30 P.M.), and the Central London Ophthalmic Hospitals operations are performed daily.

SOCIETIES.

THURSDAY.—BRITISH GYNÆCOLOGICAL SOCIETY.—Specimens will be shown by Dr. Bantock, Dr. Godson, Mr. Bowreman Jessett, Dr. Leith Napier, and Dr. Heywood Smith. Dr. Krantz: A case of Lymphangiectasis of the Omentum treated by Abdominal Section.

NEUROLOGICAL SOCIETY OF LONDON (Medical Society's Rooms, Chandos-street, W.).—8.30 P.M., Dr. Head: Disturbances of Sensation, with especial reference to the Pain of Visceral Disease.

LECTURES AND ADDRESSES.

WEDNESDAY.—WEST LONDON HOSPITAL (Hammersmith-road, W.).—5 P.M. Dr. Garrod: Less Familiar Diseases of Children. (Post-graduate Lecture.)

During the week marked copies of the following newspapers have been received:—*Norfolk Daily Standard, Western Morning News, Nottingham Guardian, Morning, Lancashire Evening Express, Kent County Examiner, Staffordshire Advertiser, South Durham Mercury, Evesham Standard, Australasian Medical Gazette, Evening Telegraph, Dundee, Times of India, City Press, Builder, Sunday Times, Pioneer Mail, Architect, Glasgow Herald, Bath Herald, Southampton Echo, Bradford Observer, Hampshire Independent, Isle of Wight Observer, Oldham Chronicle, Vegetarian, Courrier de la Presse (Paris) Bradford Daily Telegraph, Local Government Chronicle, West Middlesex Standard, Sanitary Record, Liverpool Daily Post, Reading Mercury, Hertfordshire Mercury, Weekly Free Press and Aberdeen Herald, Bristol Mercury, Yorkshire Post, Surrey Advertiser, Leeds Mercury, Local Government Journal, West Middlesex Advertiser, Public Opinion, Invention, Chard News, Mexborough Times, Nuneaton Advertiser, Essex Times, Rotherham Advertiser, Doncaster Gazette, Hobart Mercury, Alnwick Gazette, Yarmouth Mercury, Montgomery County Times, Public Health, Sligo Independent, Lowestoft Weekly Press, Staffordshire Sentinel, Islington Gazette, Chester Chronicle, Ilkeston Advertiser, Birmingham Gazette, &c, &c.*

Notes, Short Comments & Answers to Correspondents.

EDITORIAL NOTICE.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITORS," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this Office.

Lectures, original articles, and reports should be written on one side only of the paper.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers, not necessarily for publication.

We cannot prescribe or recommend practitioners.

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

Letters relating to the publication, sale and advertising departments of THE LANCET *should be addressed "To the Publisher."*

We cannot undertake to return MSS. not used.

PUBLISHER'S NOTICE.

IN order to facilitate the work of reference to the volumes of THE LANCET, we have arranged to publish duplicate copies of the Index to each half-yearly volume in a form in which they may be subsequently filed or bound together. Those of our subscribers who may wish to be supplied with loose copies can obtain the same (without extra charge) on making application to the Publisher of THE LANCET.

DRUGGISTS AND INQUESTS.

THE prescribing of druggists is a prolific source of inquests. A case in point is reported from Grantham, where a druggist undertook to prescribe for an ill-nourished infant that died of marasmus. An inquest was held. He was not blamed by the jury and was a man of standing in his business; but the coroner remarked that the evidence seemed to prove that if the child had had proper treatment it might have still been alive.

Mr. G. W. Roberts.—It is impossible in the space at our disposal to reply adequately to the question our correspondent puts, especially as he omits to mention the specific purpose for which he requires the material. He might consult, however, with advantage an article on the subject in THE LANCET, May 20th, 1893, page 1208.

J. P.—We are unable to give our correspondent a definite answer, but imagine that the presence of the State official in question is in these days more or less a matter of formality.

HOW TO STRENGTHEN THE RING FINGER AND ALSO OBTAIN A WIDER INTER-DIGITAL STRETCH FOR PIANISTS AND OTHERS.

To the Editors of THE LANCET.

SIRS,—It may, perhaps, be worth recording how I have overcome the weakness of the ring finger, since, being anxious to make myself an accomplished pianist, I set myself to work with the aid of my anatomical knowledge to try to remedy the defect, and with perfect success. I am thoroughly convinced that the defect is not a *mechanical* one to begin with, but a *physiological* one—that is to say, that it is not due to the connexion of the extensor tendon with that of the little finger, and sometimes also middle finger, but to want of development of the muscles acting upon the ring finger through want of use in early life, so that it thus falls a long way behind the other fingers, not excepting the little finger, in strength. What is required, therefore,

is some gymnastic training, and for this purpose there is nothing so useful as an ordinary table napkin ring about an inch in diameter. The ring must be gripped between, first, the little and ring fingers as hard as possible almost, whilst at the same time it is twiddled about between the two fingers by raising one and depressing the other alternately. In this way the interossei muscles are put into action and developed. At first it will be difficult and painful and soon produce cramp in the intermetacarpal space, and the ring should then be transferred to between the ring and middle fingers, after which it may be placed between the middle and index fingers and the action repeated, but for some time the exercise between the two latter fingers should be only of short duration, until it is felt that the grip between the ring and little fingers is as great as between the other fingers, for the great object is to make all the interossei about equally strong. At the same time, the ring may be twiddled after placing it *flat* on the table between the thumb and index finger in various ways, in order, first, to practise the action of doubling the thumb under the palm, so necessary in scale passages; and, secondly, to practise the action of abducting the index finger by pressing and rotating the ring firmly between the *palmar* surface of the thumb and the *side* of the index finger whilst strongly flexed. I may further state that an immense gain in facility of execution can be obtained by those possessed of comparatively short fingers by gradually stretching the web between the fingers, for this is very often one of the great obstacles to the stretching of the fingers far apart. Chopin, in order that he might be able easily to stretch wide intervals, for which his fingers were not naturally constructed, designed an instrument to wear at night for the purpose of keeping them far apart. But this uncomfortable proceeding is quite unnecessary. All that is wanted is a flat piece of wood about three-quarters of an inch wide—the handles of a good many brushes may be found to be just the thing—with rounded edges, which is then firmly pressed and see-sawed, as it were, between two adjacent fingers with the object of trying to drag the skin on the insides of the fingers down towards the web alternately. Care must be taken, however, not to press too hard, for I have several times rubbed a little bit of skin clean out. In this way the stretch between the fingers may gradually undergo an extension of half an inch to an inch, which, together with the training of the interossei muscles, which mainly shift the fingers from side to side and keep them steady, an immense improvement in facility of execution with proper practice can be secured.

I am, Sirs, yours truly,

June 25th, 1894. M.R.C.S. ENG., &c.

"A CORONER ON UNQUALIFIED ASSISTANTS."

To the Editors of THE LANCET.

SIRS,—With reference to an annotation in THE LANCET of the 30th ult., in which it is alleged that an unqualified assistant of mine had attended a man named Read, who had died suddenly in the road from hæmoptysis, and that in consequence of such unqualified attendance an inquest was necessary, I beg to say that I have seen the coroner, who regrets that he made the statement, having been misinformed by the police. I had attended the man for thirty weeks with phthisis and a large cavity. No "unqualified assistant" had seen him at all. Occasionally I employ an unqualified assistant. I have not one now; but if it were more convenient for me to do so I should not ask the coroner's or anyone else's permission. I know of many good men who from no fault of their own are slowly qualifying, getting a little money, hardly earned, and laying it by to pay for their lectures, and I would claim for them your own correspondence motto, "Audi alteram partem," and venture to express an opinion that their cases are hard enough without being decried by irresponsible men, and that, safeguarded as we now are by questions of professional misconduct, we can let the race gradually die out without fear from their competition when employed by our neighbours; and I think that your "notice" in the advertisement columns is a fair comment on their general position.

I am, Sirs, yours faithfully,

A. S. UNDERHILL, M.D., D.P.H. Camb.

Great Bridge, Tipton, July 1st, 1894.

"TREATMENT OF IMPERMEABLE STRICTURES OF THE URETHRA."

To the Editors of THE LANCET.

SIRS,—The method of Mr. Wade (THE LANCET, May 12th, 1894) is no doubt a very ingenious one, but it is not so new as he appears to think. Dr. (now Professor) Julliard of Geneva had the same idea as early as 1873, and published a pamphlet on the subject in 1875. At that time he did not apply his method in cases of very tight urethral strictures; but it has been used in this country for the treatment of such cases since 1875, and the principle is the same as Mr. Wade's—viz., the introduction of a sound open at both ends (*sonde à bout coupé*), and through this, as a guide, introducing the largest instrument, from a filiform bougie upwards. To me it is very interesting to see that two clever surgeons have hit upon the same idea at about twenty years' distance.

I am, Sirs, faithfully yours,

Paris, June 9th, 1894. A. CORDES.

THE STORES AND "A UNITED PROTEST AGAINST VIVISECTION."

A Reader.—The vigilant ladies whose kind hearts are allowed to rule their heads in the matter of anti-vivisection, oblivious of all that is going on in the way of checkmating and counteracting disease through methods developed by the humane use of experiments on animals, find their chief converts in the street and in unlikely places. A correspondent sends us an interesting account of the efforts of a lady to press into the service of anti-vivisection the young employés of the Stores, carefully avoiding the customers, which might include persons with special knowledge of the momentous issues that are at stake. If the lower animals could understand what is their share in this "great argument" they would act a more magnanimous part than some of their *protégés*. Meantime they are very badly represented.

Mr. C. H. Howaston.—Such a practitioner is within his legal rights. It may be argued that the establishment with which he is connected pays proportionate rates and taxes. But there is a question of taste and fairness involved, and it would seem reasonable that he should leave local practice to local practitioners.

O. C. J.—One of the best places in the antipodes for such a case as that mentioned is Rotorua in the North Island of New Zealand. It is in the centre of the thermal springs district, and possesses a Government sanatorium under responsible medical control.

Essequibo.—Our correspondent had better address an official application to the Colonial Office, setting forth his request and qualifications. We do not know of any suitable recent work on the subject alluded to.

F. H.—The charge varies from 5s. to 10s. 6d. a visit, according to the status of the practitioner and the value he sets on his services.

Anxious.—We do not prescribe.

ALLEGED "COVERING" OF AN ASSISTANT WHO NEVER STUDIED MEDICINE.

To the Editors of THE LANCET.

SIRS,—I shall feel obliged for an expression of opinion on the following. A few months ago I had been summoned to an obstetric case a short distance from my house. While there I received a message that a child had met with an accident and was in my surgery. My engagement just then being completed, and with a view to render any service necessary, I hurried off; but on my way I observed a man holding a child in his arms, apparently suffering. I went over to ask the cause of trouble, when a man of peculiar manners, yet well clad, addressed me thus: "This is one of our patients." Struck with the authoritative tone of voice as compared with the unprofessional appearance, I asked him if he were a medical man. He replied, "Yes." I then asked for his name, the reply being "Dr. ——, assistant." Thinking it would be unfair to the principal to trouble more, I proceeded to my house. While walking towards my home I observed this man with the injured child, evidently wanting my advice, following my footsteps until by my side, when he began speaking to me. Suddenly I heard a second voice, and beheld a figure, which proved to be that of "Dr. ——, assistant," who, to avoid contact with me, I presume, occupied the attention of the patient until past my door. My wife and her brother, who had witnessed what I describe from the window, informed me of this patient being in my surgery a few minutes previously, and being in the act of meeting me when prevented by this assistant. The assistant to Dr.—— is an army pensioner, who never spent an hour at the study of medicine until employed by this energetic medical man. I am informed by some he has attended that he is a clever doctor, and can boast of his skill at midwifery.

My object in publishing the above is merely to show how careless the Medical Council is in protecting our interests when medical men are permitted to employ discharged soldiers as assistants. How can young licentiates be blamed for opening sixpenny dispensaries or working medical aid societies when practitioners with large incomes are permitted to reject their service for that of uncultured and ill-bred men? If the Medical Council would compel the general practitioner to employ none but qualified assistance I think many of our poor, yet noble, licentiates would have an opportunity of living and doing good.

I am, Sirs, yours faithfully,

June 13th, 1894. REFORM.

*** We scarcely see how the General Medical Council can be held responsible for the unqualified assistant above described, seeing it cannot know of his existence or his duties. Even our correspondent's letter does not show that the unqualified assistant attended the case or prescribed for it without the supervision of his principal, which would have to be made clear before the principal could be censured. The interest of our correspondent's letter consists in his statement that a medical man employs as an assistant one who is an army pensioner and never spent an hour at the study of medicine.—ED. L.

COMMUNICATIONS not noticed in our present issue will receive attention in our next.

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